

STEREO INTEGRATED AMPLIFIER/TUNER

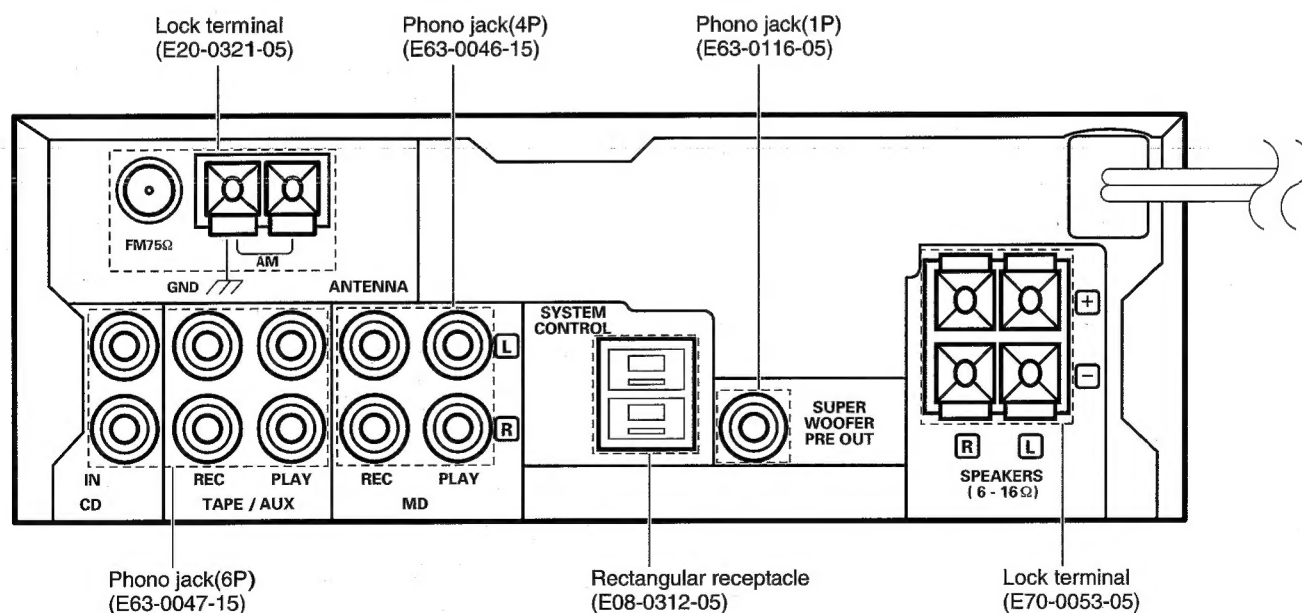
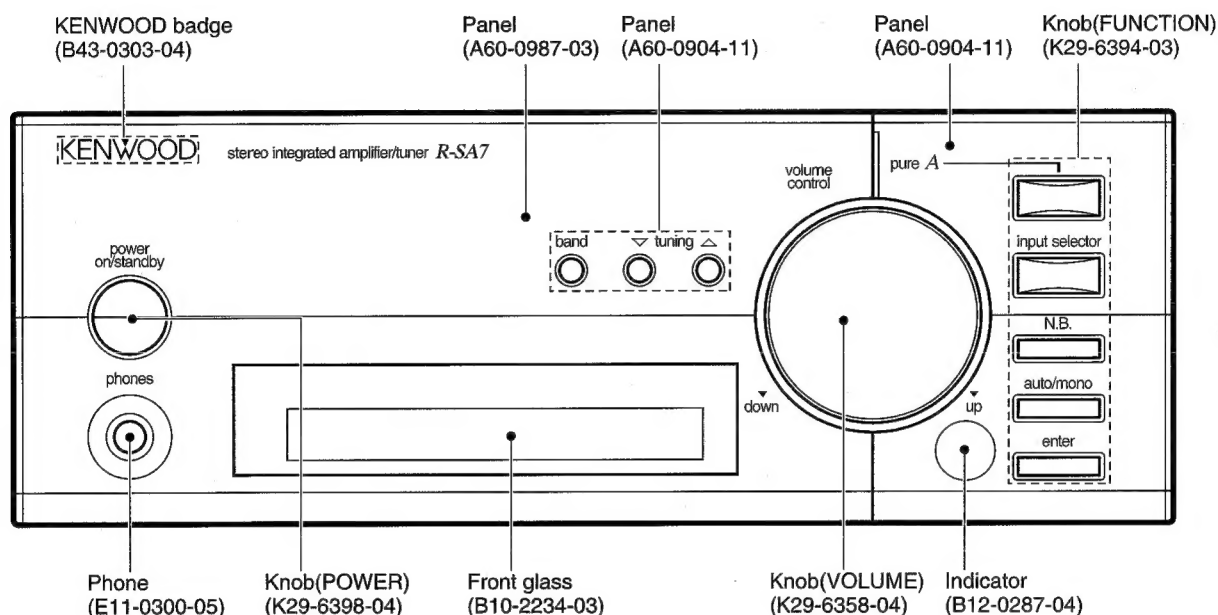
R-SA7

SERVICE MANUAL

(HM-7)

KENWOOD

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Caution : No connection of ground line if disassemble the unit.
Please connection the ground line on rear panel, PCBs, Chassis and some others.

R-SA7

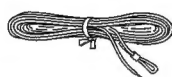
CONTENTS / ACCESSORIES

Contents

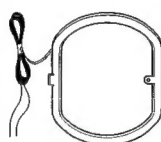
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Accessories

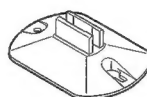
FM indoor antenna.....(1)
(T90-0809-05)



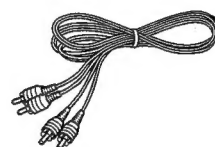
AM loop antenna.....(1)
(T90-0820-05)



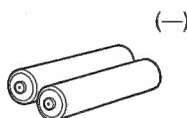
Loop antenna stand (1)
(J19-3645-05)



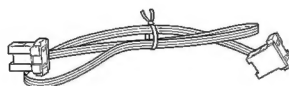
Audio cord.....(1)
(E30-0615-05)



Batteries (R6/AA).....(2)

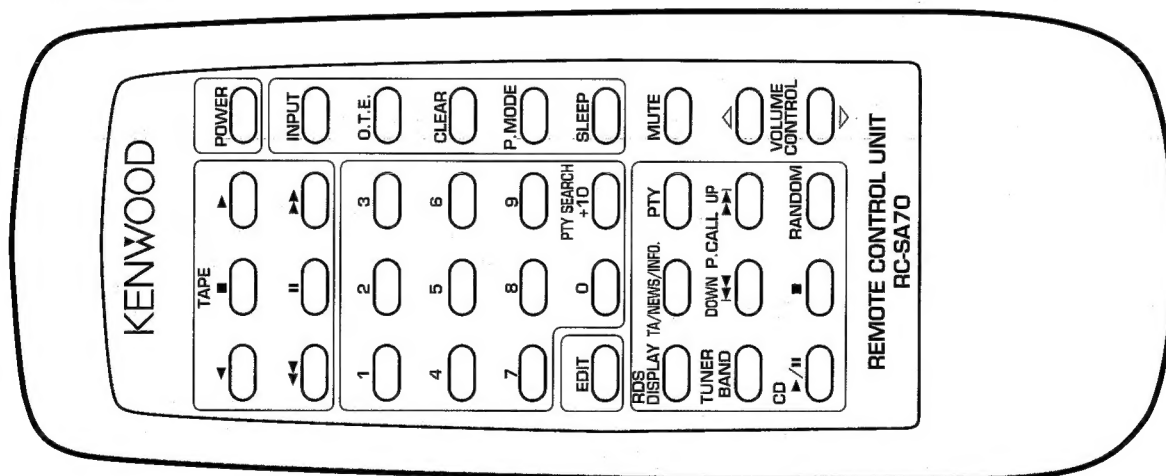


System control cord.....(1)
(E30-2628-05)



Remote control unit.....(1)
(A70-1086-05)

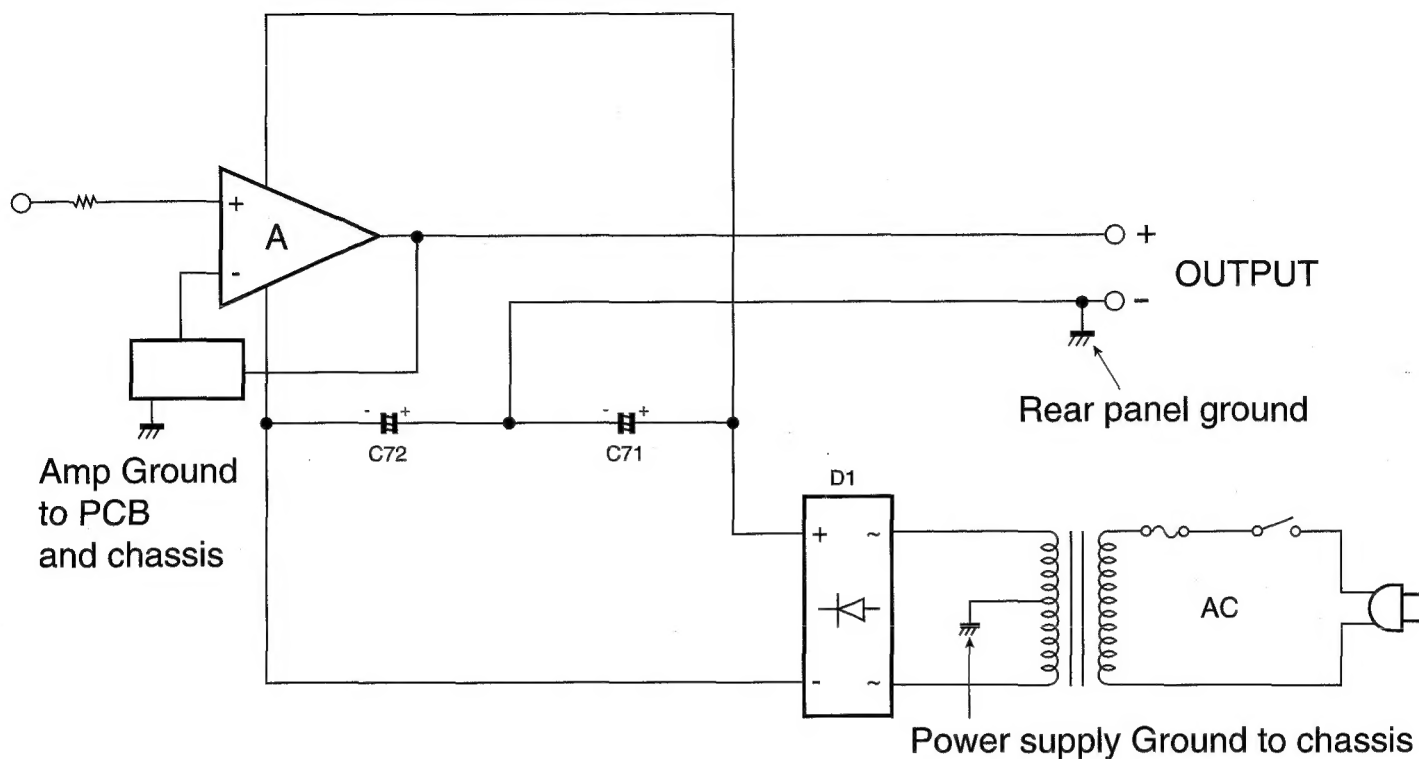
Battery cover (A09-0356-08)



System configuration

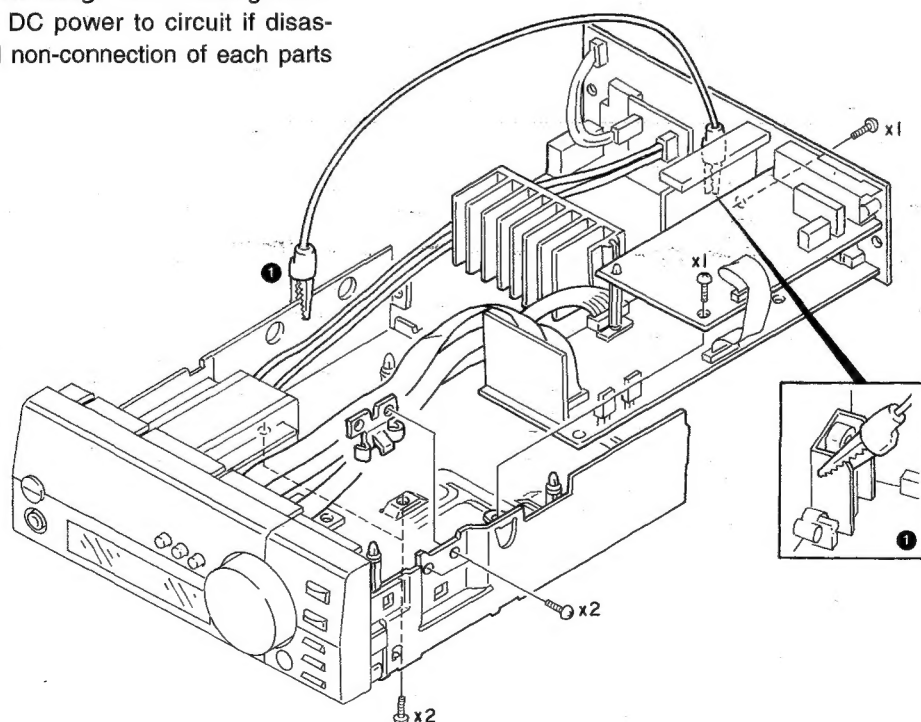
SYSTEM NAME	RECEIVER	CD PLAYER	CASSETTE DECK
HM-7	R-SA7	DP-SA7	X-SA7

CAUTION FOR REPAIR



DISASSEMBLY FOR REPAIR

Caution : R-SA7's circuit design use chassis ground.
Not supply DC power to circuit if disassembly and non-connection of each parts on R-SA7.



Connect the alligator clip with wire between main chassis and the ground of system control. (①)

CIRCUIT DESCRIPTION

1. INITIAL STATE

(1) AMP-related block

• POWER	OFF
• SELECTOR SOURCE	TUNER
• DISPLAY	SELECTOR
• N.B. CIRCUIT	OFF
• A CLASS VOLUME VALUE	1.40 STEP
• AB CLASS VOLUME VALUE	7 STEP
• PURE MODE	NORMAL (AB CLASS)
• AUTO POWER SAVE	OFF

(2) TUNER-related block

• BAND	FM
• FREQUENCY	Lower-limit value of receiving frequency.
FM	87.5 MHz
AM	531 kHz
• AUTO/MANUAL	AUTO
• P.CH MEMORY	Last frequency
• Last P.CH	01ch
• RDS DATA TABLE MEMORY	NO DATA

(3) TIMER-related block

• CLOCK	STOP (AM12:00)
• PROGRAM	WORKING MODE OFF
CONTENTS OF PROGR.	ON=AM 12:00
	OFF=AM 12:00
	PLAY MODE=PLAY
	SELECTOR=TUNER(1ch)
	REC MODE OFF
• OTT	WORKING MODE OFF
OTT ON TIME	AM 7:00

(4) TEST PRESET FREQUENCY

Channel	BAND	E TYPE	Channel	BAND	E TYPE
01ch	FM	87.50MHz	11ch	FM	90.00MHz
02ch	FM	97.50MHz	12ch	FM	98.00MHz
03ch	FM	108.00MHz	13ch	FM	98.50MHz
04ch	AM	630kHz	14ch	FM	106.00MHz
05ch	AM	999kHz	15ch	AM	531kHz
06ch	AM	1440kHz	16ch	AM	990kHz
07ch	FM	87.50MHz	17ch	AM	1602kHz
08ch	FM	87.50MHz	18ch	FM	87.50MHz
09ch	FM	87.50MHz	19ch	FM	87.50MHz
10ch	FM	89.10MHz	20ch	FM	87.50MHz

※ The initial setting is performed in a following event :

1. When backup memory data is destroyed when reset is applied to the microprocessor.
2. When the power cord is plugged in to the AC wall outlet while pressing the POWER key.

2. BACKUP

This function holds the current state of the unit even if the AC power of the receiver is turned OFF.

(1) Operation outline

The backup state set command signal (CE) of a microcomputer is set low when the AC power is turned OFF. The microcomputer detects the signal and enters the stop state. The microcomputer is reset when the AC power is turned ON. The data for backup state confirmation is checked by reset processing.

The microcomputer is initialized when the data was destroyed. If it is not destroyed, the microcomputer is started in the backup state.

- The data for backup state confirmation is written in a RAM area.
- The microcomputer is set to the STOP mode so as to save the power consumption.
- A backup state set command signal is detected by a timer interrupt of 1 msec.
- The backup guarantee period is set in a circuit.

(2) Backup state setting

- The data (5A69H) for backup state confirmation is written in a RAM area.

(3) Contents of backup data to be held

--- AMP ---

- POWER ON/OFF
- DISPLAY MODE
- SELECTOR SOURCE
- N.B. CIRCUIT MODE
- A CLASS VOLUME VALUE
- AB CLASS VOLUME VALUE
- PURE A MODE

--- TUNER ---

- LAST BAND
- PRESET CHANNEL/RECEIVING STATION FREQUENCY/PI/TA/PTY/PS
- LAST RECEIVING STATION FREQUENCY AND PRESET CHANNEL (AM/FM)
- PRESET MEMORY data (1ch~40ch)
- AUTO/MANUAL

--- CLOCK/TIMER ---

- LAST CLOCK DATA
- PROGRAMMED CONTENTS/PROGRAM TIMER WORKING MODE ON/OFF
- O.T.T. SETTING TIME/O.T.T. WORKING MODE ON/OFF

CIRCUIT DESCRIPTION

3. DESTINATION LIST OF TUNER

Table 3-1 Destination List of Tuner

Destination	BAND	Receive frequency range	channel space	IF	PLL reference frequency	DIODE SW0 (D518)
E3 (RDS)	FM	87.5MHz ~108.0MHz	50kHz	+10.7MHz	25kHz	1
	AM	531kHz ~1602kHz	9kHz	+450kHz	9kHz	

DIODE SW(DSWX) : 1 = With DIODE
(When static, input HIGH)

※ ATTENTION

The RDS PTY AF search always corresponds to a span search of 100kHz. Therefore, a span search of 50 kHz cannot be performed.

4. TEST MODE

4-1. Initializing

The system is initialized when the power is turned on while pressing the POWER key.

(1) Contents of operation

- All the functions are initialized.

4-2. AMP test mode using main unit's keys

4-2-1. Entering the AMP test mode

- Turn on the power while pressing the TUNING DOWN key.

4-2-2. Canceling the AMP test mode

- By turning off the power, the system is initialized and the test mode is canceled.

4-2-3. Contents of AMP test mode

(1) Automatic POWER ON

- The POWER ON state is entered whenever the power is turned on while pressing the TUNING DOWN key. All functions are then initialized and activated in the all-lighting mode.
- Sub-clock oscillation diagnosis function
The oscillation diagnosis (existence of oscillation and measurement of period) of a sub-clock is performed before the test mode is entered. If the diagnosis result is OK, the system enters the test mode.
If the diagnosis result is NG, the oscillation of the sub-clock is diagnosed again. If the result is OK, the system enters the test mode. If the diagnosis result is continuously NG five times, the system stops with ERR 1 and ERR 2 displayed.

(2) All-lighting mode

- All the fluorescent display indicators and LED lamps light when the power is turned on while pressing the TUNING DOWN key.

- After that, the all-lighting mode is canceled when any main unit's key is pressed. The normal display obtained when the selector is set to TUNER then appears.

(3) Others

- The AMP test mode is not terminated even if the selector is set to positions other than TUNER.
- In the AMP test mode, the muting during mode selection is not controlled. However, the operation during the power-on sequence is the same as the normal operation.
- The SP protection operation is also the same as the normal operation.
- In the AMP test mode using main unit's keys, the keys below provide a special operation according to the position where the selector is set. The main unit's keys except described below and the rotary encoder provide the normal operation.

(4) When selector is set to TUNER

Key	Operation
CLASS A key	Increments the P.CALL every time this key is pressed.
N.B. key	Decrement the P.CALL every time this key is pressed.
ENTER key	Selects the display cyclically in the order below every time this key is pressed.

- ① Write data in the unused area of EEPROM, then read the written data. If the read data is the same as the written data, "RAM OK" is displayed in the fluorescent display indicator. If the former is different from the latter, "RAM NG" is displayed.
- ② Set the TUNER ATT to OFF and display the S level in hexadecimal when the ENTER key is pressed. ("ATT OFF ***" is displayed in the fluorescent display indicator.)
- ③ Set the TUNER ATT to ON and display the S level in hexadecimal when the ENTER key is pressed. ("ATT ON ***" is displayed in the fluorescent display indicator.)

* The special display using the ENTER key is continued until the next operation is carried out. (**: S LEVEL)

When keys other than ENTER are pressed in items ① to ③ above, the TUNER ATT is set to OFF and the normal display appears. The operation corresponding to the key that has been pressed is performed in this case.

(5) When selector is set to positions other than TUNER

[ENTER key] Sets the master volume to the middle value (NORMAL 18 and LOW POWER 3.60) every time this key is pressed.

* The normal operation is performed when the ENTER key is continuously pressed for two seconds (nothing is done).

[TUNING UP key] Sets the master volume to the maximum value (NORMAL 70 and LOW POWER 12.00) every time this key is pressed.

[TUNING DOWN key] Sets the master volume to the minimum value (NORMAL 1 and LOW POWER 0.20) every time this key is pressed.

CIRCUIT DESCRIPTION

[AUTO key] Selects the MUTE operation and equalizer cyclically in the order below for operation display every time this key is pressed.

-- -> MUTE operation -> Minimum -> Maximum -> Flat --

* In the operation for except the AUTO key, the equalizer is made flat.

[BAND key] Every time this key is pressed, all the displays go off and the normal display is selected cyclically.

4-3. RDS test mode using main unit's keys

4-3-1. Entering the RDS test mode

- Turn on the power while pressing the TUNING UP key.

4-3-2. Canceling the RDS test mode

- By turning off the power, the system is initialized and the test mode is canceled.

4-3-3. Contents of RDS test mode

- The POWER ON state is entered whenever the power is turned on while pressing the TUNING UP key. All the functions are then initialized.
- In the RDS test mode using main unit's keys, the keys below provides a special operation according to the position where the selector is set. The main unit's keys except described below and the rotary encoder provide the normal operation.

Key	Operation
CLASS A key	Performs the same operation as for remote control key "DISPLAY" every time this key is pressed.
INPUT SEL. key	Performs the same operation as for remote control key "PTY" every time this key is pressed.
N.B. key	Performs the same operation as for remote control key "TA" every time this key is pressed.
ENTER key	Selects the display cyclically in the order below every time this key is pressed.

① Write data in the unused area of EEPROM, then read the written data. If the read data is the same as the written data, "RAM OK" is displayed in the fluorescent display indicator. If the former is different from the latter, "RAM NG" is displayed.

② Set the TUNER ATT to OFF and display the S level in hexadecimal when the ENTER key is pressed. ("ATT OFF ***" is displayed in the fluorescent display indicator.)

③ Set the TUNER ATT to ON and display the S level in hexadecimal when the ENTER key is pressed. ("ATT ON ***" is displayed in the fluorescent display indicator.)

* The special display using the ENTER key is continued until the next operation is carried out. (**: S LEVEL)

When keys other than ENTER are pressed in items ① to ③ above, the TUNER ATT is set to OFF and the normal display appears. The operation corresponding to the key that has

4-4. SERIAL TEST MODE

(1) Setting the serial test mode

The unit is put into the serial test mode when a serial code "TEST ON" is input during the POWER-ON sequence.

In the 16-bit serial test mode, serial code C27FH is input.

- In the serial test mode, all remote control keys and ordinary serial codes are disabled. Only the panel keys perform the same operation as usually.

(2) Canceling the serial test mode

- The serial test mode is canceled to return to the ordinary mode by inputting a "TEST OFF" code (C27 EH). After the ordinary mode was returned, the serial mode is returned to the state before the test mode is entered. The backup operation is not initialized.
- The serial test mode is also canceled when the AC power is turned OFF.

(3) Cautions

- The serial test code is prescribed as a 16-bit code only.
- The operations below are inhibited in the serial test mode. The operations mentioned above cannot be guaranteed when they are performed in the serial test mode.
- An identical code is output when the serial test mode code is input.

CIRCUIT DESCRIPTION

(4) SERIAL TEST CODE LIST(C2XXH)

TYPE	AMP								TUNER							
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	POWER OFF	CD DIRECT OFF	SP B OFF	DUAL SOUND LEVEL1	NB OFF	TV/SAT (TV/CABLE) (INPUT)	INPUT LEVEL MIN		POWER OFF	0	MEMORY (ENTER)					
1	POWER ON	CD DIRECT ON	SP B ON	DUAL SOUND LEVEL2	OMNI SP ON	FRONT SP ON	INPUT LEVEL MID		POWER ON	1	MAIN					
2	PHONO	CD REC OFF	HIT MASTER OFF	DUAL SOUND LEVEL3	MUTING (-30dB) OFF	FRONT SP OFF	INPUT LEVEL MAX	LOW POWER MODE ON	MUTE OFF	2	SUB					
3	CD	CD REC ON	HIT MASTER ON	DUAL SOUND INPUT CD	MUTING (-30dB) ON	C/S SP ON	DIMMER OFF	LOW POWER MODE OFF	MUTE ON	3	BOTH					
4	TUNER	SOURCE DIRECT OFF	MOTOR VOL UP	DUAL SOUND INPUT TUNER	NB LEVEL1	C/S SP OFF	DIMMER 1		AUTO STEREO	4	AF					
5	TAPE (TAPE A)	SOURCE DIRECT ON	MOTOR VOL DOWN	DUAL SOUND INPUT TAPE	NB LEVEL2	C/S MUTE ON	DIMMER 2		MONO	5	PTY					
6	TAPE2 (TAPE B)	LINE STRAIGHT OFF	MOTOR VOL STOP	DUAL SOUND INPUT MD/DAT	NB LEVEL3	VIDEO5	IR REPEATER TEST		TUNED OFF	6	DISPLAY					
7	AUX	SINE STRAIGHT ON	OBS/TV	DUAL SOUND INPUT VIDEO	BALANCE Lch MAX	MENU	MD (INPUT)		TUNED ON	7	ANTENNA A					
8	DAT	LOUDNESS OFF	TAPE2 MONITOR OFF	DUAL SOUND INPUT AV/AUX	BALANCE Lch/Rch CENTER	TOPE CONTROL OFF	TV (INPUT)		ACTIVE RECEPTION OFF	8	ANTENNA B					
9	VIDEO1 (VIDEO)	LOUDNESS ON	TAPE2 MONITOR ON	BGM OFF	BALANCE Rch MAX	TOPE CONTROL ON	CABLE/sat (INPUT)	FL ALL OFF OFF	ACTIVE RECEPTION ON	9	PS DISPLAY					FL ALL OFF OFF
A	VIDEO2	SUB SONIC OFF	VIDEO MUTE ON	BGM ON	L.A.C. MAIN MAX	BASS MIN	SUB MUTE ON	FL ALL OFF ON	ATT ON	+10	SIGNAL LEVEL DISP OFF					FL ALL OFF ON
B	VIDEO3	SUB SONIC ON	LAC VOL UP	FAN OFF	L.A.C. MAIN/SUB CENTER	BASS MID		ALL ON OFF	ATT OFF	BAND FM	SIGNAL LEVEL DISP ON					ALL ON OFF
C	VIDEO4 (VDP)	SUPER WOOFER OFF	LAC VOL DOWN	FAN ON	L.A.C. SUB MIN	BASS MIX	BASS DOWN	ALL ON ON	IF WIDE	BAND AM/DM	TUNER DIRECT (u-COM DATA)					ALL ON ON
D	MUTE ON (MAIN)	SUPER WOOFER ON	LAC VOL STOP	FAN SPEED LOW	FAN STOP LOW	TREBLE MIN	BASS UP	AMP INITIAL	IF NORMAL	BAND TV/LW						TUNER INITIAL
E	SEL MUTE ON	SPEAKER A OFF (FRONT)	DUAL SOUND OFF	FAN SPEED HIGH	FAN STOP HIGH	TREBLE MID	TREBLE DOWN	AMP SERIAL TEST OFF	IF NARROW	DOWN						TUNER SERIAL TEST OFF
F	MUTE3 ALL OFF	SPEAKER A ON (FRONT)	DUAL SOUND ON	NB ON	LD (INPUT)	TREBLE MAX	TREBLE UP	AMP SERIAL TEST ON	DIRECT	UP						TUNER SERIAL TEST ON

: SENDING CODE

: RECEIVING CODE

(C3XXH)

TYPE		SURROUND							GE								
FUNC		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0																	
1																	
2																	
3																	
4																	
5																	
6										M1 (ALL CEN)							
7										M2 (ALL MAX)							
8										M3 (ALL MIN)							
9										EEPROM TEST							
A																	
B																	
C																	
D																	
E																	
F																	


: SENDING CODE

: RECEIVING CODE

CIRCUIT DESCRIPTION

(C4XXH)

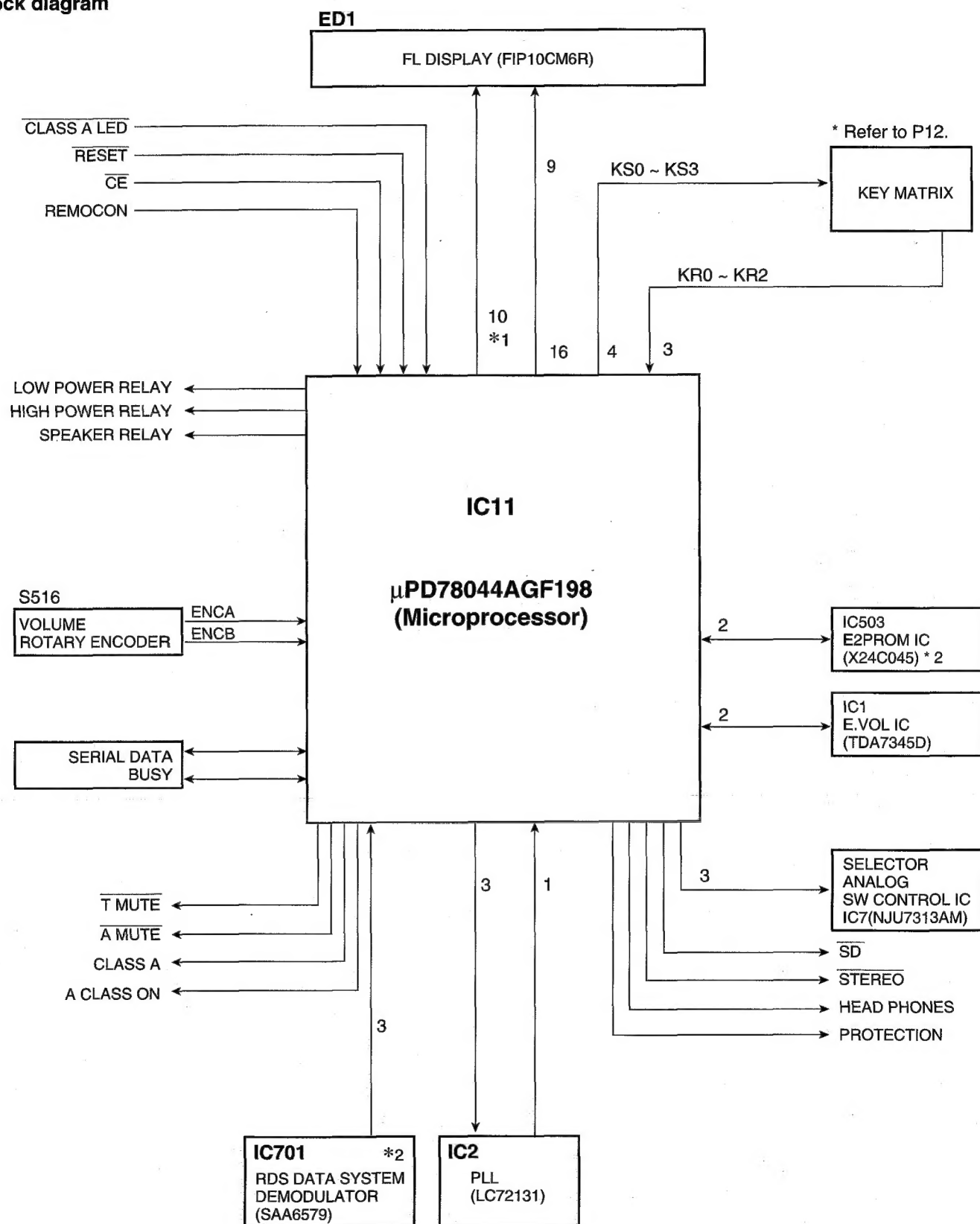
H L	VOLUME LEVEL															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	VOLUME 0	VOLUME 16	VOLUME 32	VOLUME 48	VOLUME 64											
1	VOLUME 1	VOLUME 17	VOLUME 33	VOLUME 49	VOLUME 65											
2	VOLUME 2	VOLUME 18	VOLUME 34	VOLUME 50	VOLUME 66											
3	VOLUME 3	VOLUME 19	VOLUME 35	VOLUME 51	VOLUME 67											
4	VOLUME 4	VOLUME 20	VOLUME 36	VOLUME 52	VOLUME 68											
5	VOLUME 5	VOLUME 21	VOLUME 37	VOLUME 53	VOLUME 69											
6	VOLUME 6	VOLUME 22	VOLUME 38	VOLUME 54	VOLUME 70											
7	VOLUME 7	VOLUME 23	VOLUME 39	VOLUME 55												
8	VOLUME 8	VOLUME 24	VOLUME 40	VOLUME 56												
9	VOLUME 9	VOLUME 25	VOLUME 41	VOLUME 57												
A	VOLUME 10	VOLUME 26	VOLUME 42	VOLUME 58												
B	VOLUME 11	VOLUME 27	VOLUME 43	VOLUME 59												
C	VOLUME 12	VOLUME 28	VOLUME 44	VOLUME 60												
D	VOLUME 13	VOLUME 29	VOLUME 45	VOLUME 61												
E	VOLUME 14	VOLUME 30	VOLUME 46	VOLUME 62												
F	VOLUME 15	VOLUME 31	VOLUME 47	VOLUME 63												

 : SENDING CODE  : RECEIVING CODE

CIRCUIT DESCRIPTION

5. Microprocessor : μ PD78044AGF198 (X09 : IC11)

Block diagram



*1 GRID to FL

*2 E/T Type (RDS feature installed) used RDS data system demodulator.

CIRCUIT DESCRIPTION

5-1. Pin function

Pin NO.	Name	Port I/O	Description	Active	
1	7G	O	FL grid 7	—	
2	6G	O	FL grid 6	—	
3	5G	O	FL grid 5	—	
4	4G	O	FL grid 4	—	
5	3G	O	FL grid 3	—	
6	2G	O	FL grid 2	—	
7	1G	O	FL grid 1	—	
8	VDD	—	Micro processor power supply (+5V)	—	
9	E2PROM SCL	O	E2PROM control clock	—	
10	E2PROM SDA	O	E2PROM control data	—	
11,12	NC	O		—	
13	SCL	O	Electric volume IC control clock	—	
14	SDA	O	Electric volume IC control data	—	
15	A CLASS ON	O	Power ON/OFF control signal	H : ON	L : OFF
16	SEL STB	O	Selector IC strobe	—	
17	RESET	I	Microprocessor reset	L : RESET ON	
18	SEL/PLL CLK	O	SEL/PLL IC control clock	—	
19	SEL/PLL DATA	O	SEL/PLL IC control data	—	
20	AVSS	—	A/D power SUPPLY (GND)	—	
21	AMUTE	O	Audio mute signal	L : ON	
22	TMUTE	O	Tuner mute signal	L : MUTE ON	
23	STEREO	I	Stereo signal detection	L : STEREO ON	
24	SD	I	Synchronized signal detection	—	
25	PLL DO	O	IF count data	—	
26	PLL CE	O	PLL Chip enable control	L : CE	
27	HEAD PHONES	I	Head phones signal detection	H : ON	L : OFF
※28	S.LEVEL(RDS)	I	Signal level	—	
29	A VDD	—	A/D power supply (+5V)	—	
30	A VREF	—	A/D reference voltage(+5V)	—	
31	OSC	—	32kHz oscillator	—	
32	OSC	—	32kHz oscillator	—	
33	Vss	—	Microprocessor power supply (GND)	—	
34,35	OSC	—	4.19MHz oscillator	—	
36	PROTECTION	I	Protection detection	H : ON	L : OFF
37	SP RELAY	O	Speaker relay control	H : ON	L : OFF
38	HIGH	O	AMP HIGH relay control	H : ON	L : OFF
39	CLASS A	O	CLASS A control signal	H : A CLASS	L : AB CLASS
40	LOW RELAY	O	AMP low relay control	H : ON	L : OFF

※ E/T type only, other types unused.

CIRCUIT DESCRIPTION

Pin NO.	Name	Port I/O	Description	Active	
41	S.DATA	I/O	16bit system data	—	
42	S.BUSY	I/O	16 bit system busy	H : BUSY	L : READY
43	NC	O		—	
※44	CLK(RDS)	I	RDS clock	—	
※45	DATA(RDS)	I	RDS data	—	
46	NC	O		—	
47	REMOCON	I	Remote control input	—	
48	IC	—		—	
49	ENCA	I	Volume encoder input A	—	
50	ENCB	I	Volume encoder input B	—	
51	CLASS A LED	O	CLASS A LED	H : OFF	L : ON
52	VDD	—	Microprocessor power supply (+5V)	—	
53	NC	O		—	
54	\overline{CE}	I	AC OFF(MAIN POWER) detection Signal	L : AC OFF	
55~57	NC	O		—	
58	KR2	I	KEY return 2	H : KEY ON	
59	KR1	I	KEY return 1	H : KEY ON	
60	KR0	I	KEY return 0	H : KEY ON	
61	P16/KS3	O	FL Segment 6 /key scan 3	H : ON	
62	P15/KS2	O	FL Segment 5 /key scan 2	H : ON	
63	P14/KS1	O	FL Segment 4/key scan 1	H : ON	
64	P13/KS0	O	FL Segment 3/key scan 0	H : ON	
65	P12	O	FL Segment 2	H : ON	
66	P11	O	FL Segment 1	H : ON	
67	P10	O	FL Segment 7	H : ON	
68	P9	O	FL Segment 8	H : ON	
69	P8	O	FL Segment 9	H : ON	
70	P7	O	FL Segment 10	H : ON	
71	V load	—	FL drive power supply (-30V)	—	
72	P6	O	FL Segment 11	H : ON	
73	P5	O	FL Segment 12	H : ON	
74	P4	O	FL Segment 13	H : ON	
75	P3	O	FL Segment 14	H : ON	
76	P2	O	FL Segment 15	H : ON	
77	P1	O	FL Segment 16	H : ON	
78	10G	O	FL Segment 10	—	
79	9G	O	FL grid 9	—	
80	8G	O	FL grid 8	—	

※ E/T type only, other types unused.

The RDS PTY AF search always corresponds to a span search of 100kHz. Therefore, a span search of 50 KHz cannot be performed.

CIRCUIT DESCRIPTION

6. KEY MATRIX

KSCN \ KRTN	KR0(60)	KR1(59)	KR2(58)
KS0(64)	POWER	AUTO/MONO	TUNINGDOWN
KS1(63)	N. B. CIRCUIT	CLASS A	TUNINGUP
KS2(62)	INPUT	ENTER	BAND
KS3(61)	DIODE SW (D518)		

(Port# of microprocessor)

7. CIRCUIT DESCRIPTION.

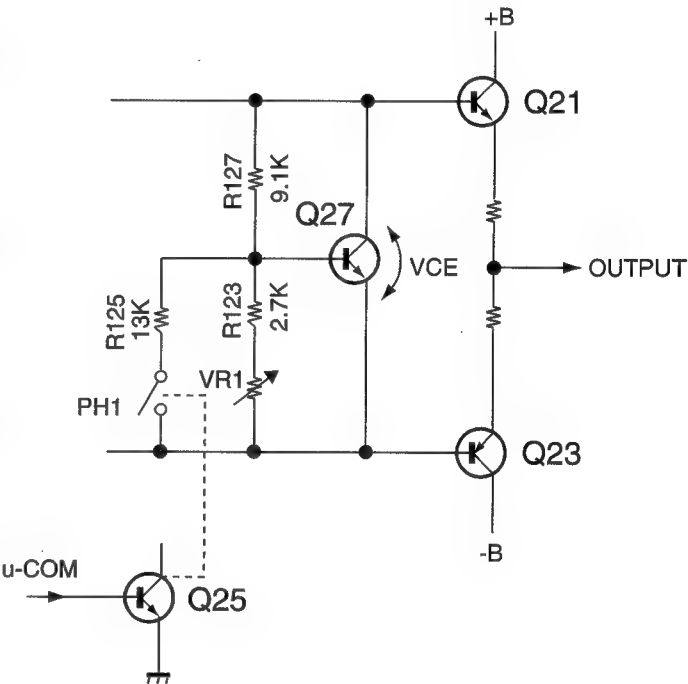
R-SA7 uses switching circuit class-A and class-B in final stage of power amplifier.

CLASS-B

As Q25 has low signal from microprocessor and Q25 and PH1, both are turn-off.
Q27' s bias is decided by R123, 127, and VR1. Bias current of Q21 and 23 is 30mA.
Power supply for Q21 and 23 is high tap(22V) of power trans-
former.

CLASS-A

As Q25 has high signal from microprocessor, Q25 and PH1 are turn-on.
Q27' s bias is decided by R123, 127, VR1 and 125. Bias cur-
rent of Q21 and 23 is increased by rising up Vce of Q27.
Heat loss is big in class-a. Power supply for Q21 and 23 is low
tap(10V) of that for protecting power transistors.



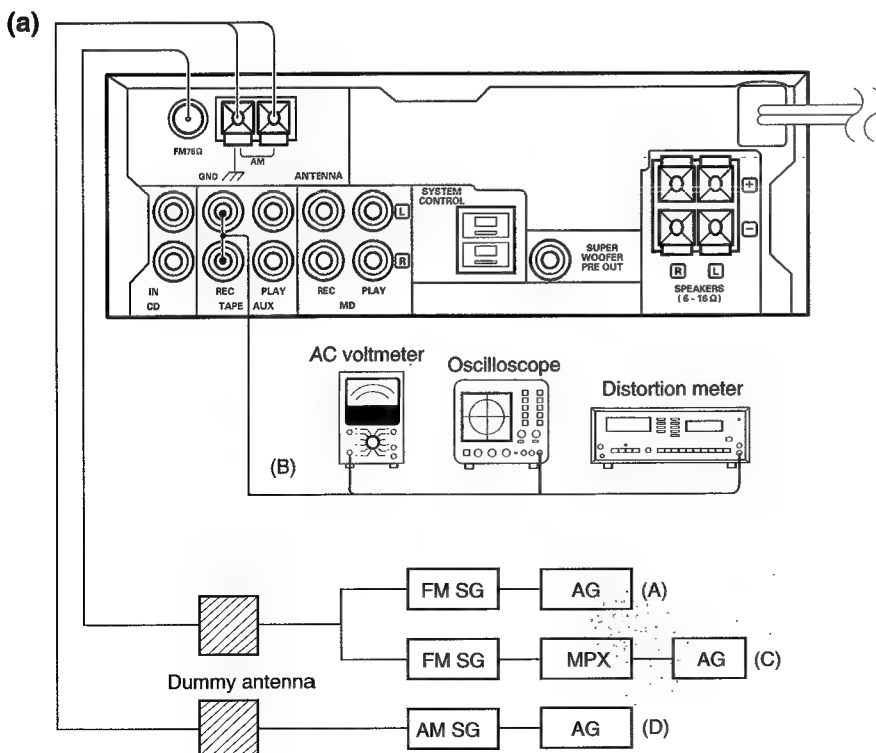
ADJUSTMENT

FM SECTION SELECTION : FM
X05-4622-70 (E/T TYPE)

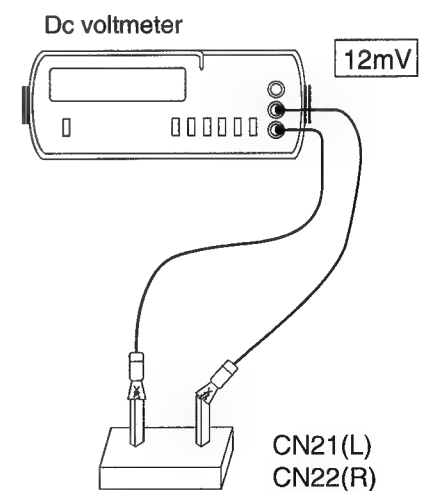
NO.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	TUNER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	DISCRIMINATOR	(A) 98.0kHz 1kHz, ± 75 kHz dev. 60dB μ (ANT input)	Connect a DC voltmeter between Pin 1 and Pin 2 of CN 2.	MONO 98.0MHz	L 31	0V	(a)
					L 32	Minimum distortion.	
2	DISTORTION (STEREO)	(C) 98.0MHz 1kHz, ± 68.25 kHz dev. Pilot: ± 6.75 kHz dev. 60dB μ (ANT input)	(B)	AUTO 98.0MHz	IFT (A1)	Minimum distortion.	(a)

AUDIO SECTION (X09-4462-71)

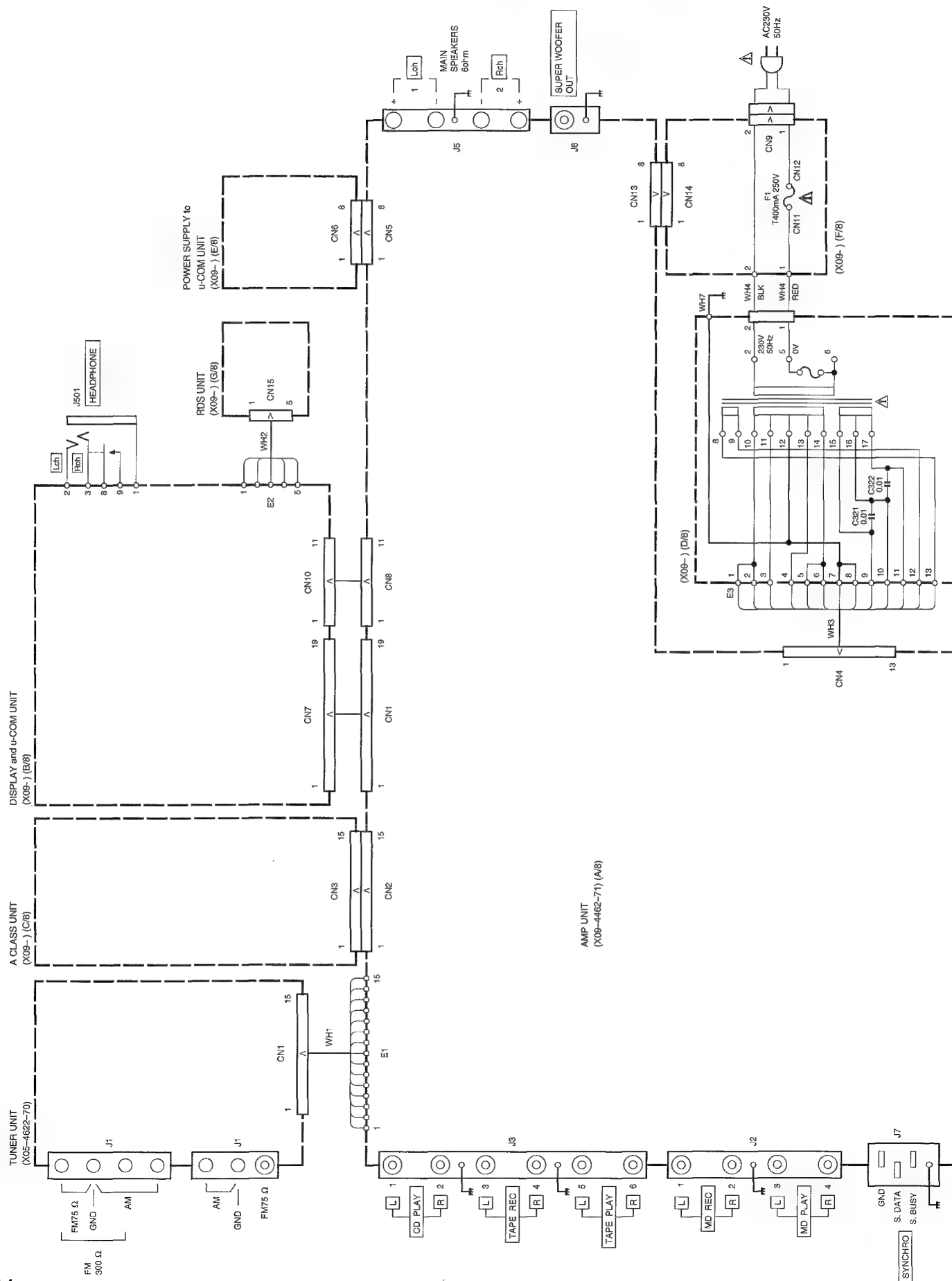
NO.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMP SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
POWER: ON SPEAKER: B REC OUT: OFF							
1	B CLASS IDLE CURRENT	—	Connect a DC voltmeter across CN21(L) CN22(R) (X09, A/8)	PURE A : OFF Volume : 0	VR1(L) VR2(R) (X09, A/8)	12mV	(b)
2	A CLASS IDLE CURRENT	—		PURE A : ON Volume : 0		Less than 260mV. (Check)	



(b) **System connections**



WIRING DIAGRAM

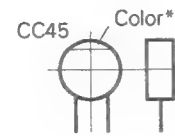


R-SA7

PARTS DESCRIPTIONS

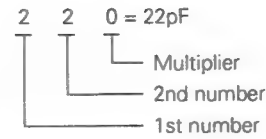
CAPACITORS

CC	45	TH	1H	220	J
1	2	3	4	5	6
1 = Type ... ceramic, electrolytic, etc.			4 = Voltage rating		
2 = Shape ... round, square, ect.			5 = Value		
3 = Temp. coefficient			6 = Tolerance		



Capacitor value

010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001μF
103 = 0.01μF



Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = -470 ± 60ppm/°C

Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 -20	+80 -20	+100 -0	More than 10μF - 10 ~ +50 Less than 4.7μF - 10 ~ +75

(Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

Voltage rating

2nd word	A	B	C	D	E	F	G	H	J	K	V
1st word											
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	-

Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)
Refer to the table above.

(EX) C K 7 3 F F 1 H 0 0 0 Z
1 2 3 4 5 6 7
(Chip) (B, F)
1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension (Chip capacitors)

Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0

RESISTORS

Chip resistor (Carbon)

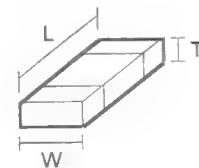
(EX) R K 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
(Chip) (B, F)

Carbon resistor (Normal type)

(EX) R D 1 4 B B 2 C 0 0 0 J
1 2 3 4 5 6 7

1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Rating wattage
6 = Value
7 = Tolerance

Dimension



Dimension (Chip resistor)

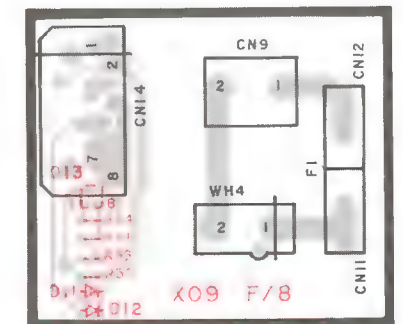
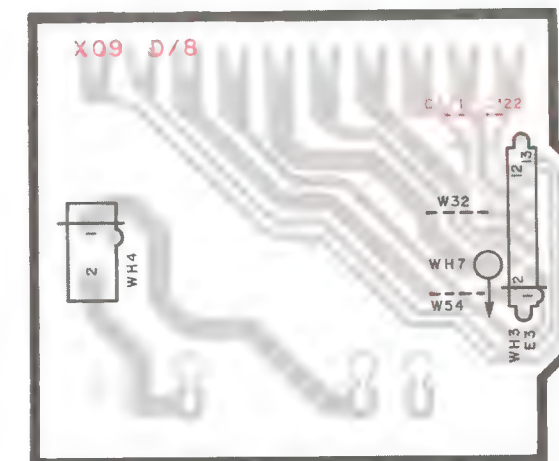
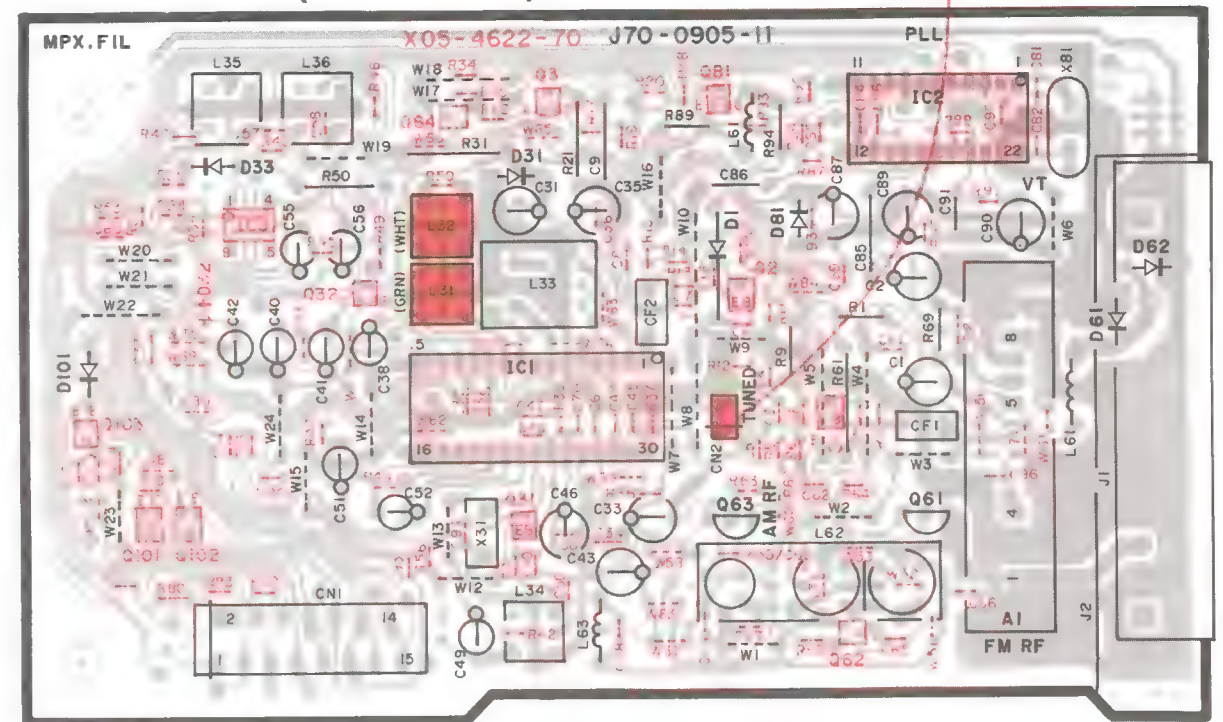
Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6 ± 0.2	0.8 ± 0.2	0.5 ± 0.1

Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

PC BOARD (Component side view)

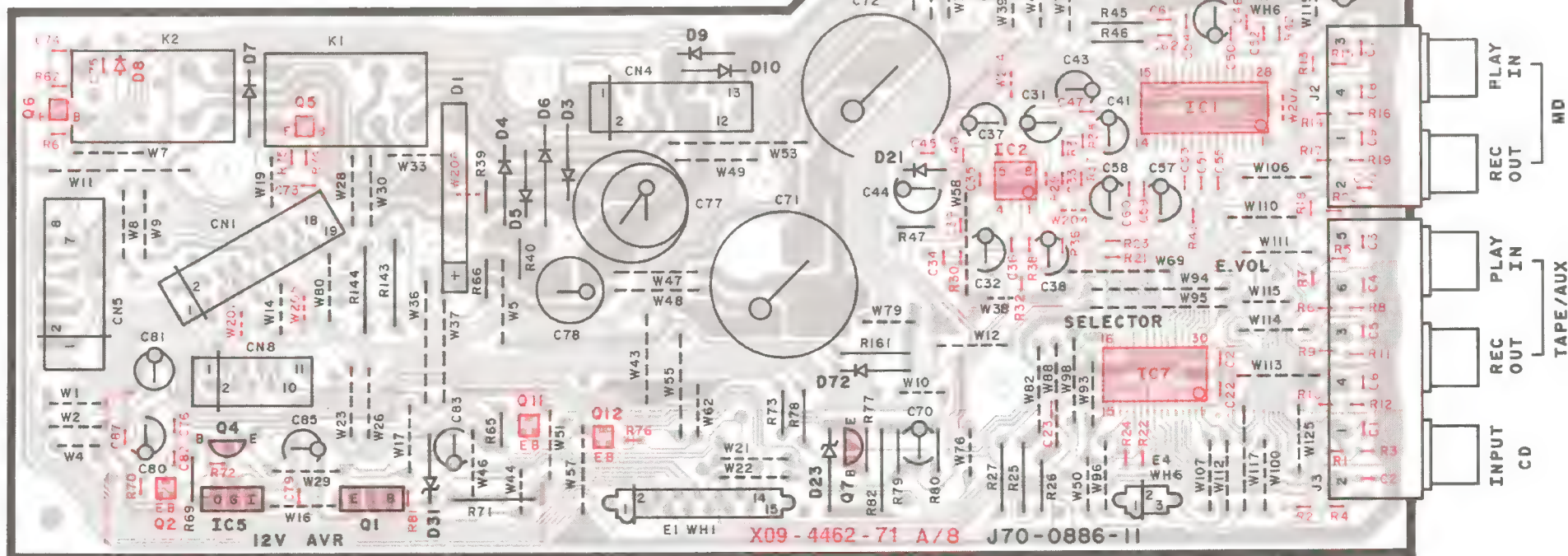
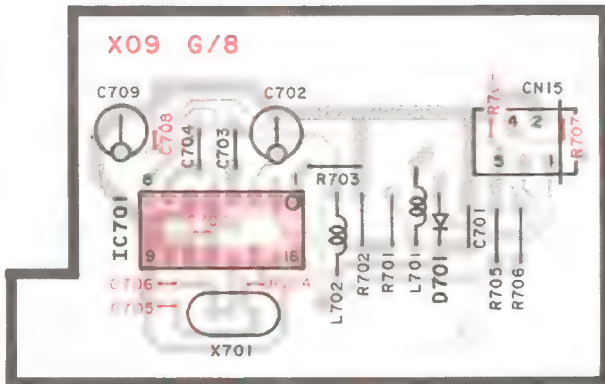
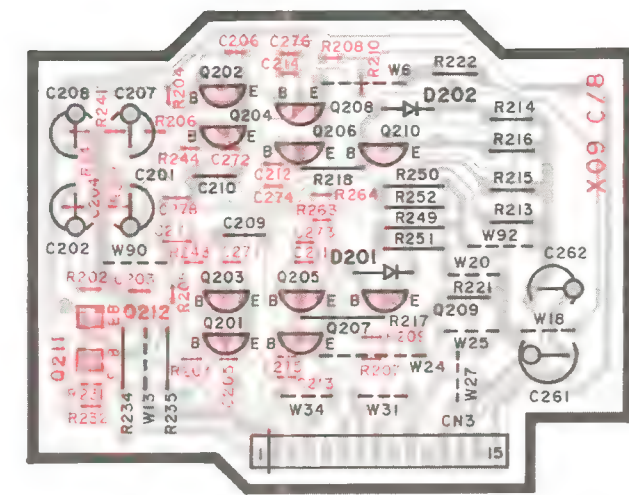
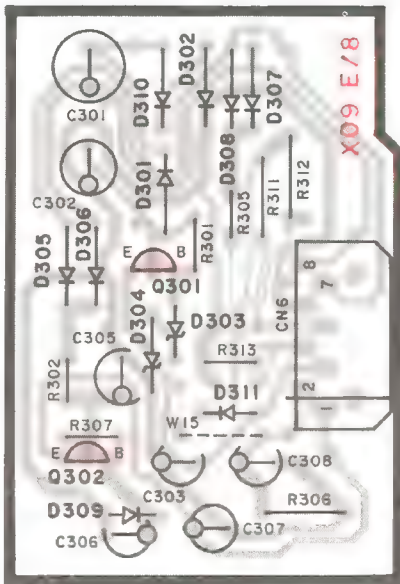
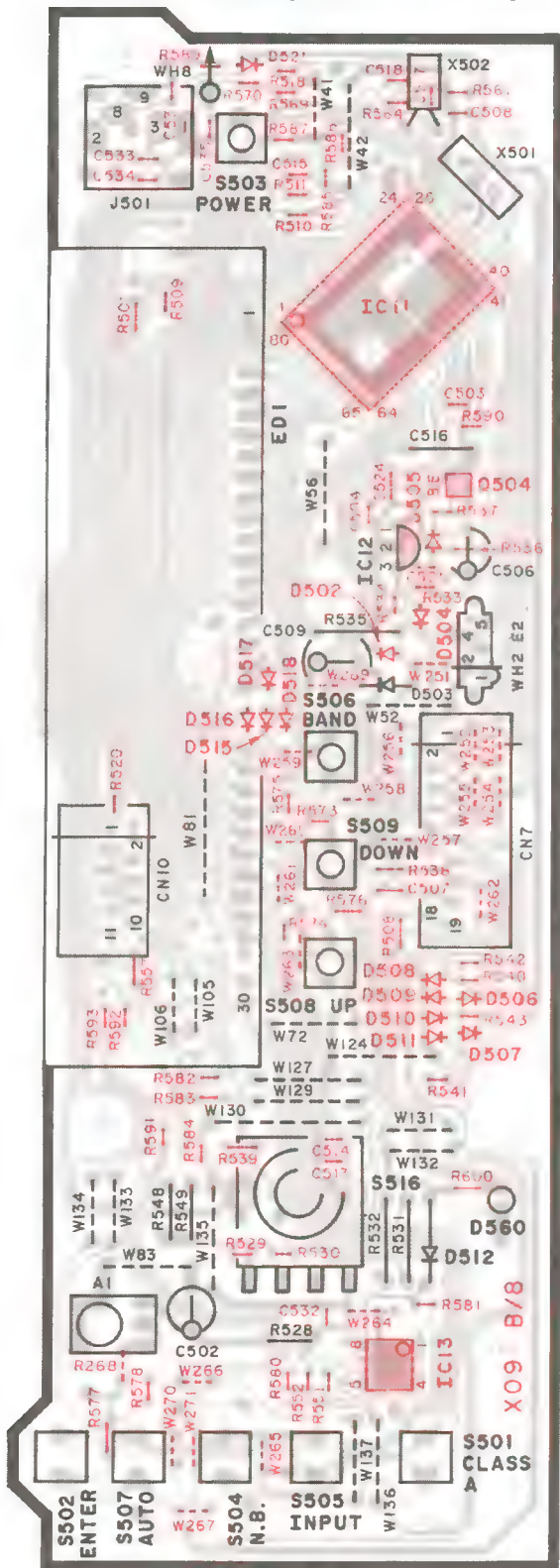
TUNER UNIT (X05-4622-70)



Refer to the schematic diagram for the value of resistors and capacitors.

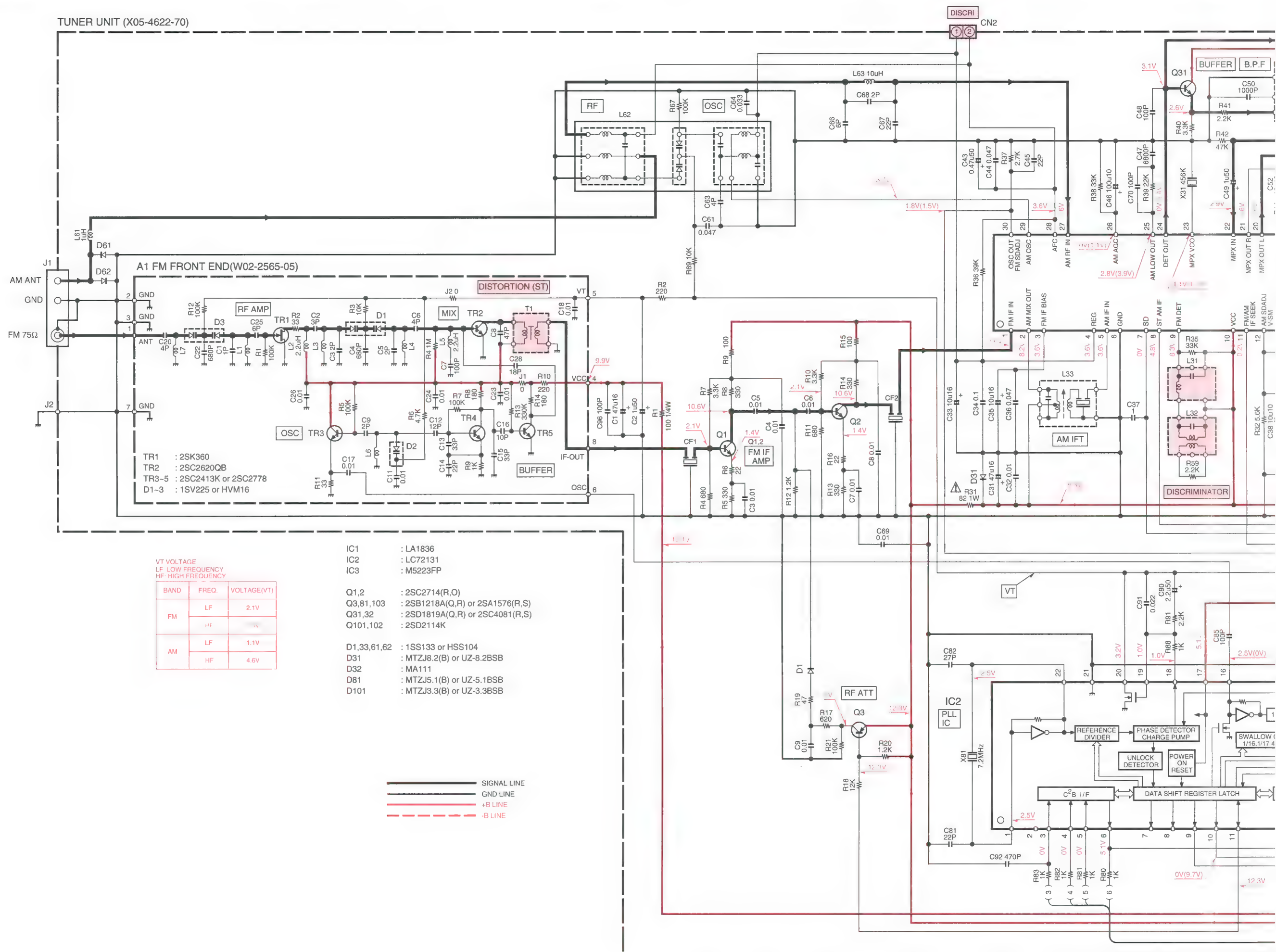
PC BOARD(Component side view)

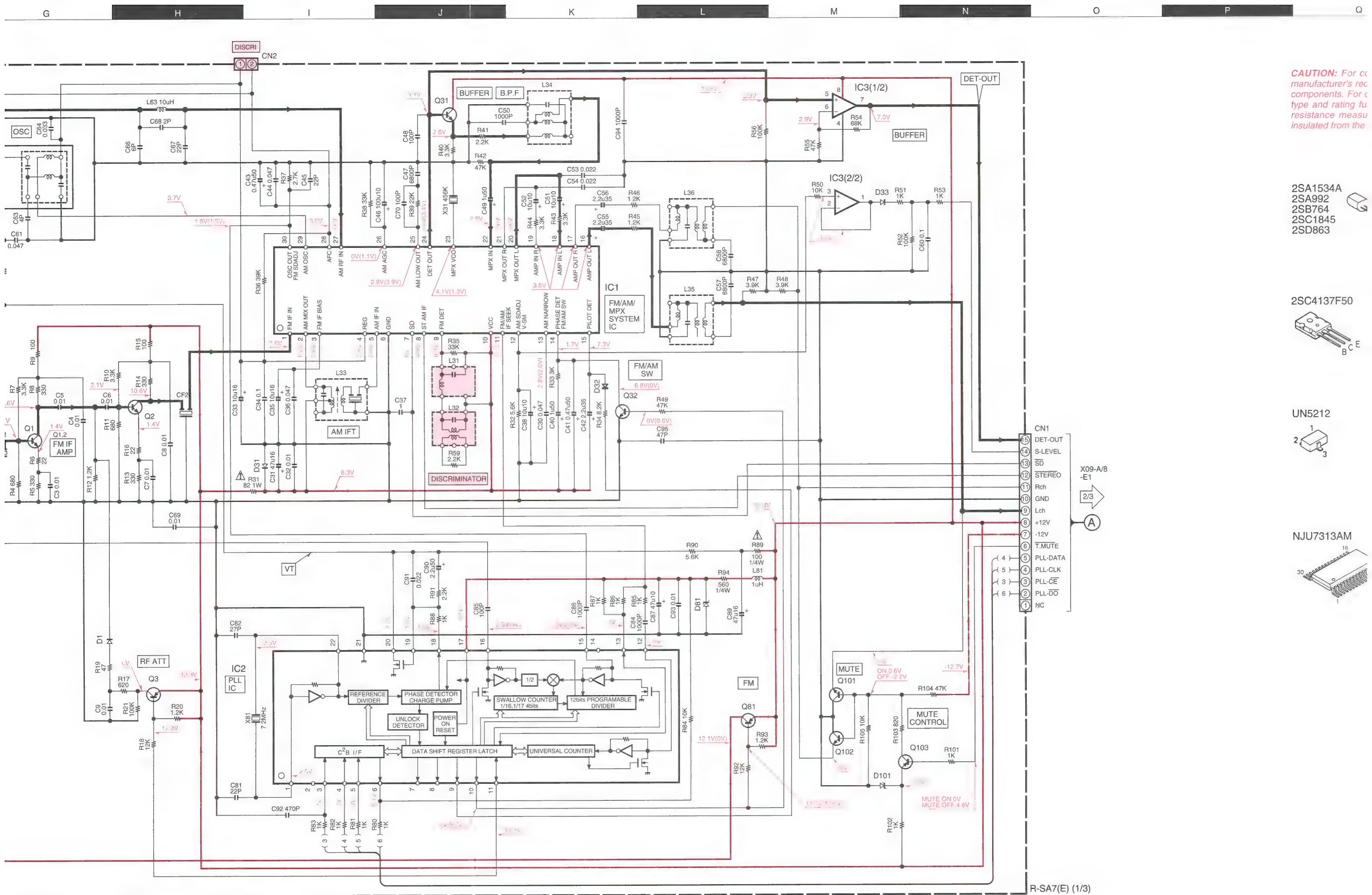
AUDIO UNIT (X09-4462-71)



DC voltmeter
Bclass
Idle current : 12mV(20mA)

TUNER UNIT (X05-4622-70)





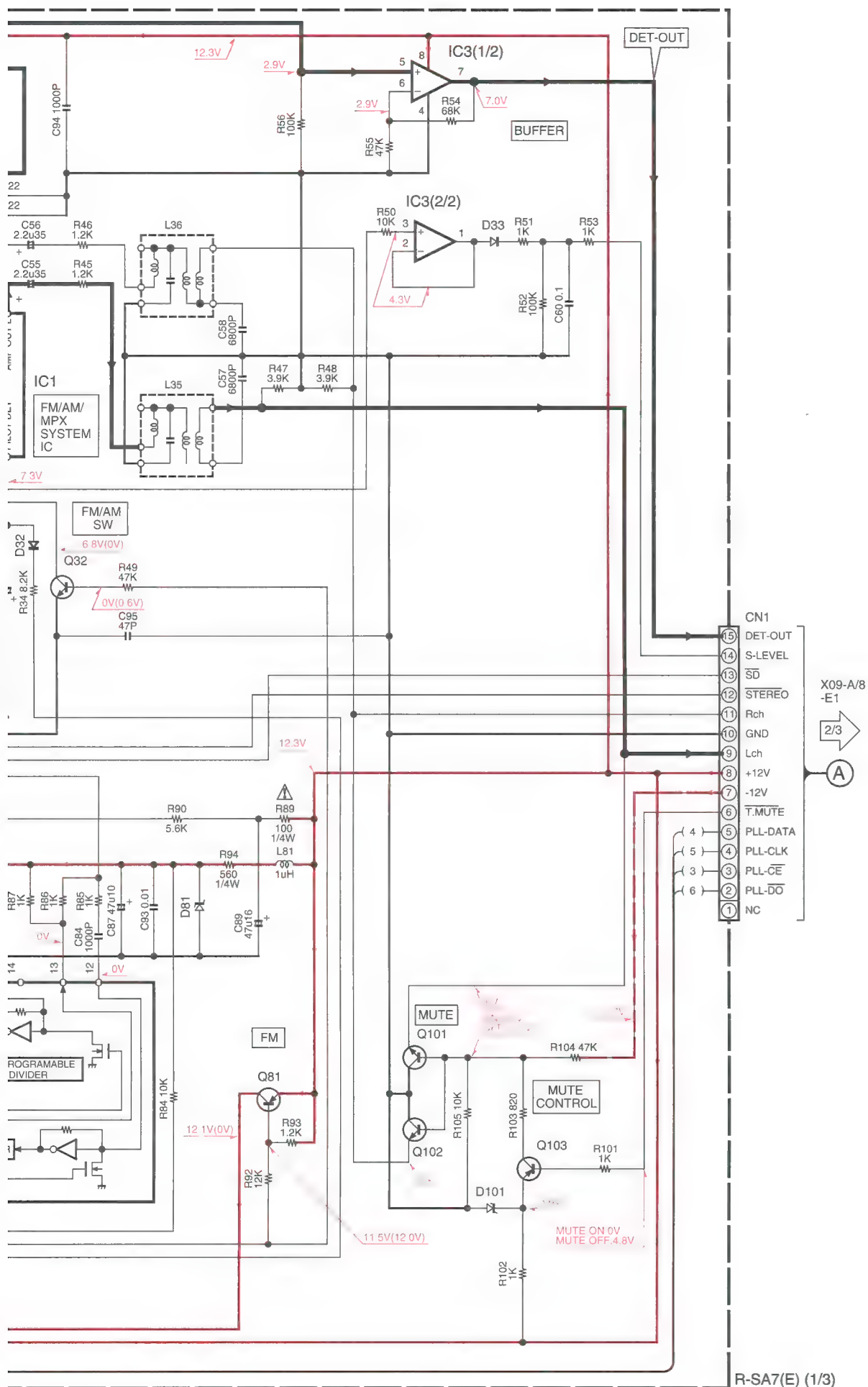
CAUTION: For correct operation, use the manufacturer's recommended components. For correct operation, use the correct type and rating for all components. Resistance measurements should be taken with the circuit insulated from the ground.

2SA1534A
2SA992
2SB764
2SC1845
2SD863

2SC4137F50

UN5212

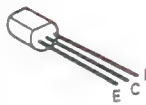
NJU7313AM



CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Δ indicates safety critical components. For continued protection against risk of fire, replace only with same type and rating fuse(s). To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

The DC voltage is an actual reading measured with a high impedance type voltmeter with no signal input. The measurement value may vary depending on the measuring instruments used or on the product.

2SA1534A
2SA992
2SB764
2SC1845
2SD863



2SA1175



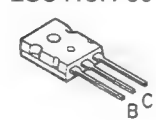
2SA933S



2SA1576
2SB1218A
2SC2714
2SC4081
2SD1819A
2SD2114K



2SC4137F50



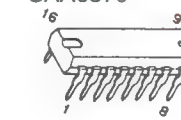
2SD2061



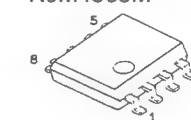
2SD2012



SAA6579



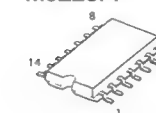
NJM4565M



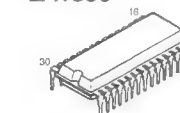
UN5212



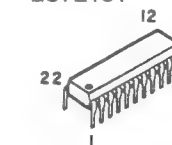
M5223FP



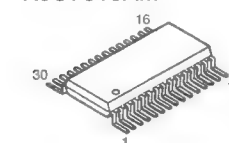
LA1836



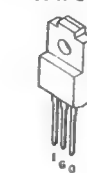
LC72131



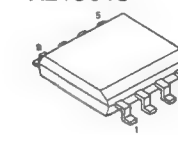
NJU7313AM

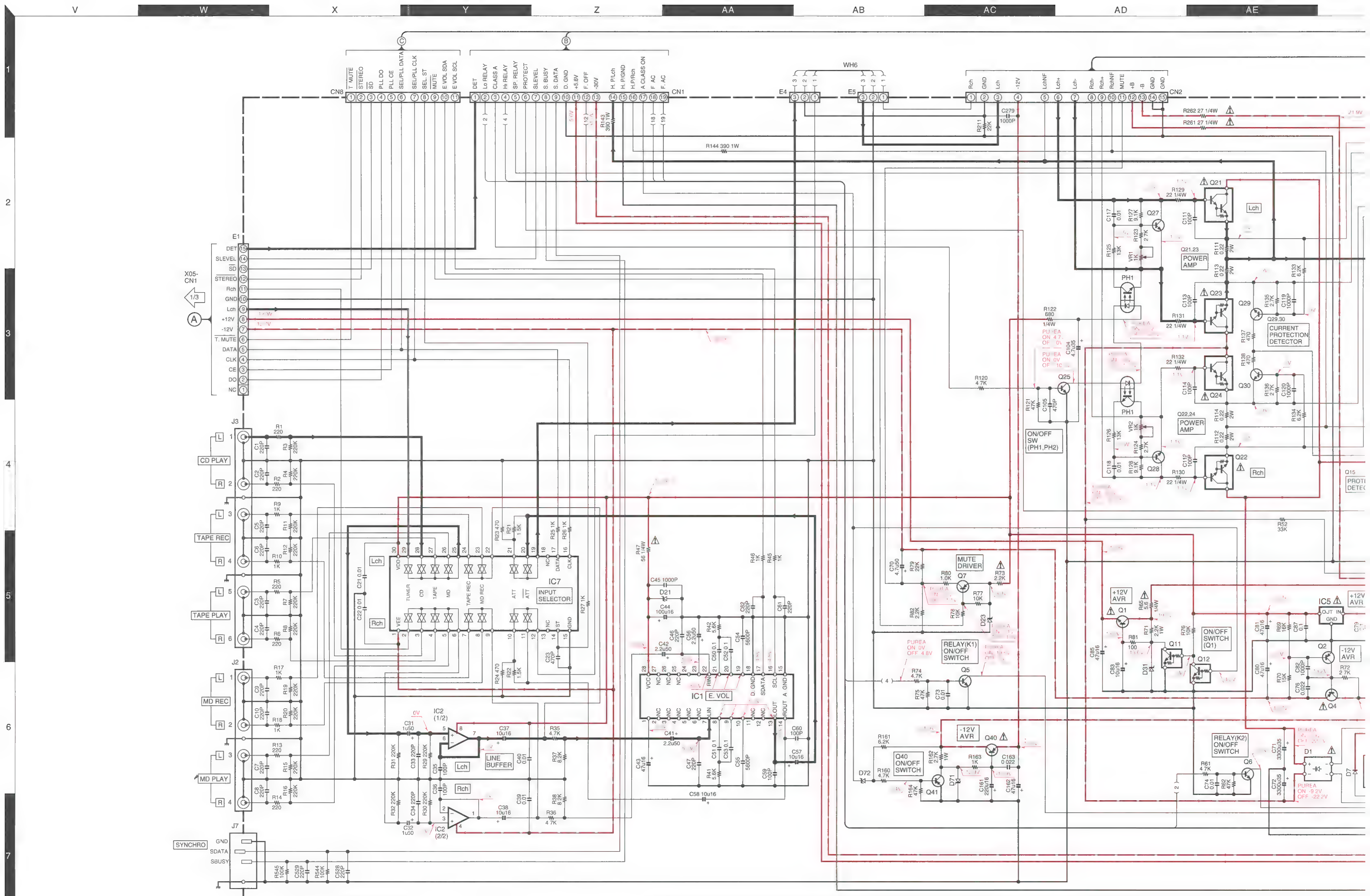


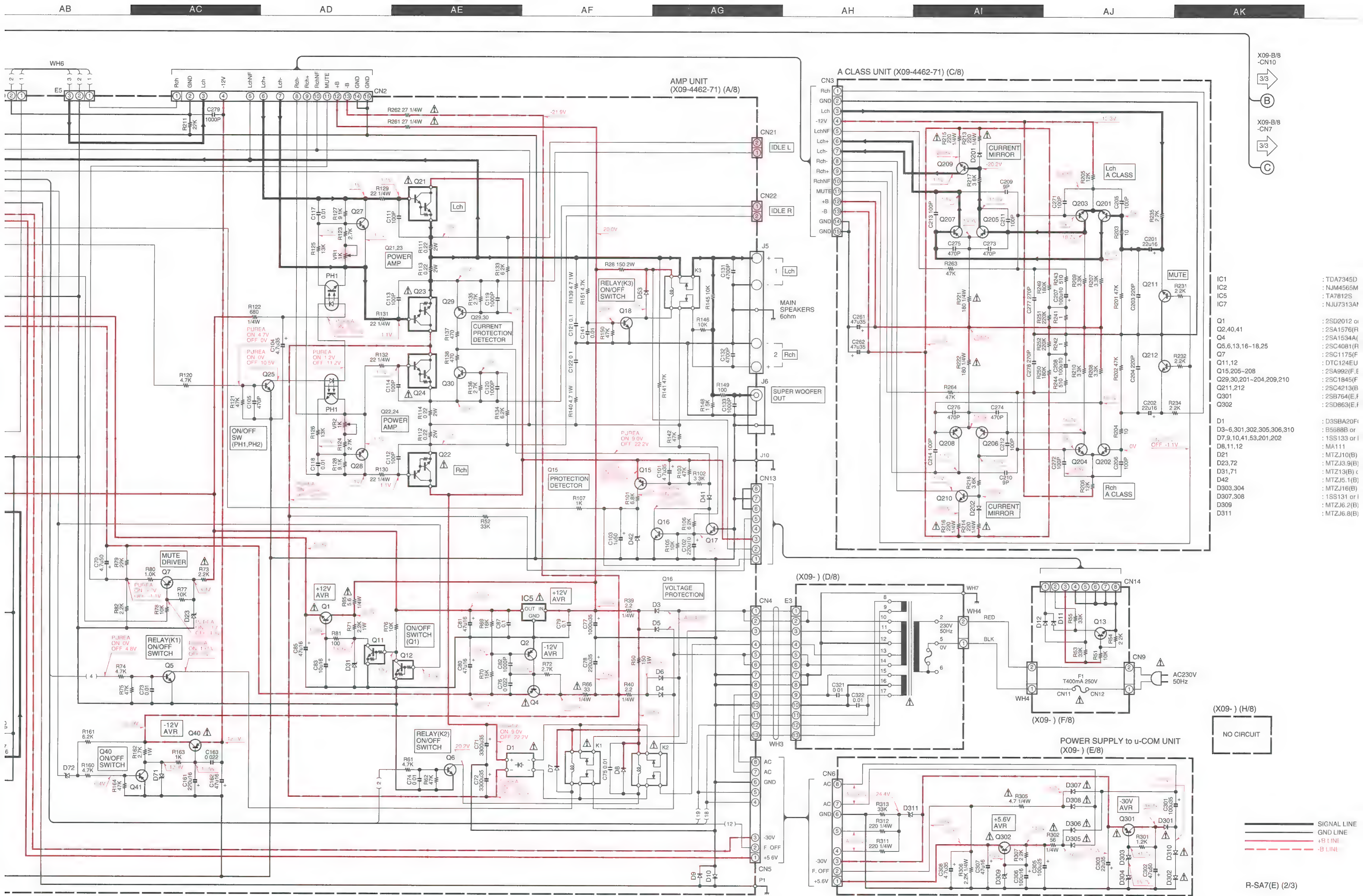
TA7812S

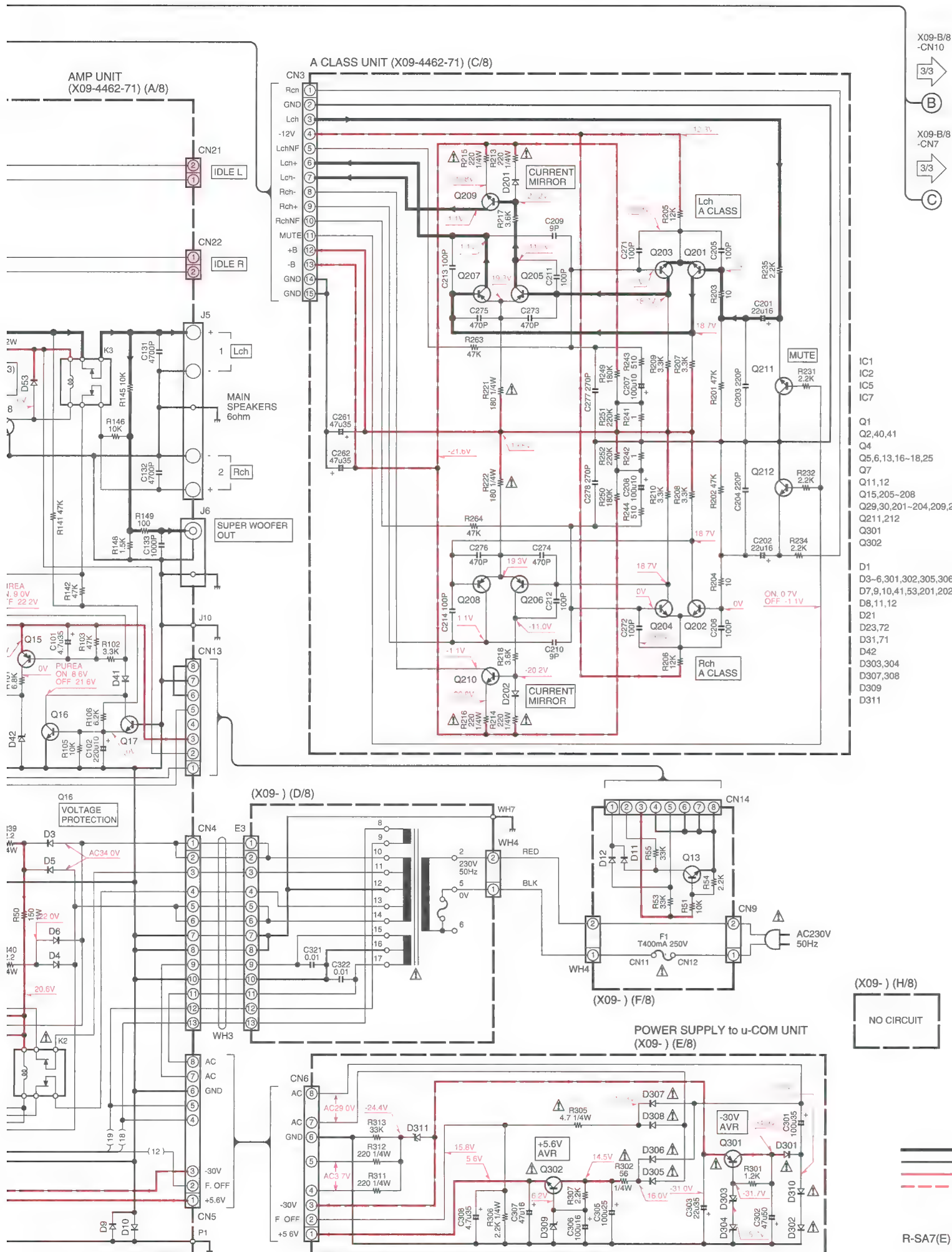


X24C04S







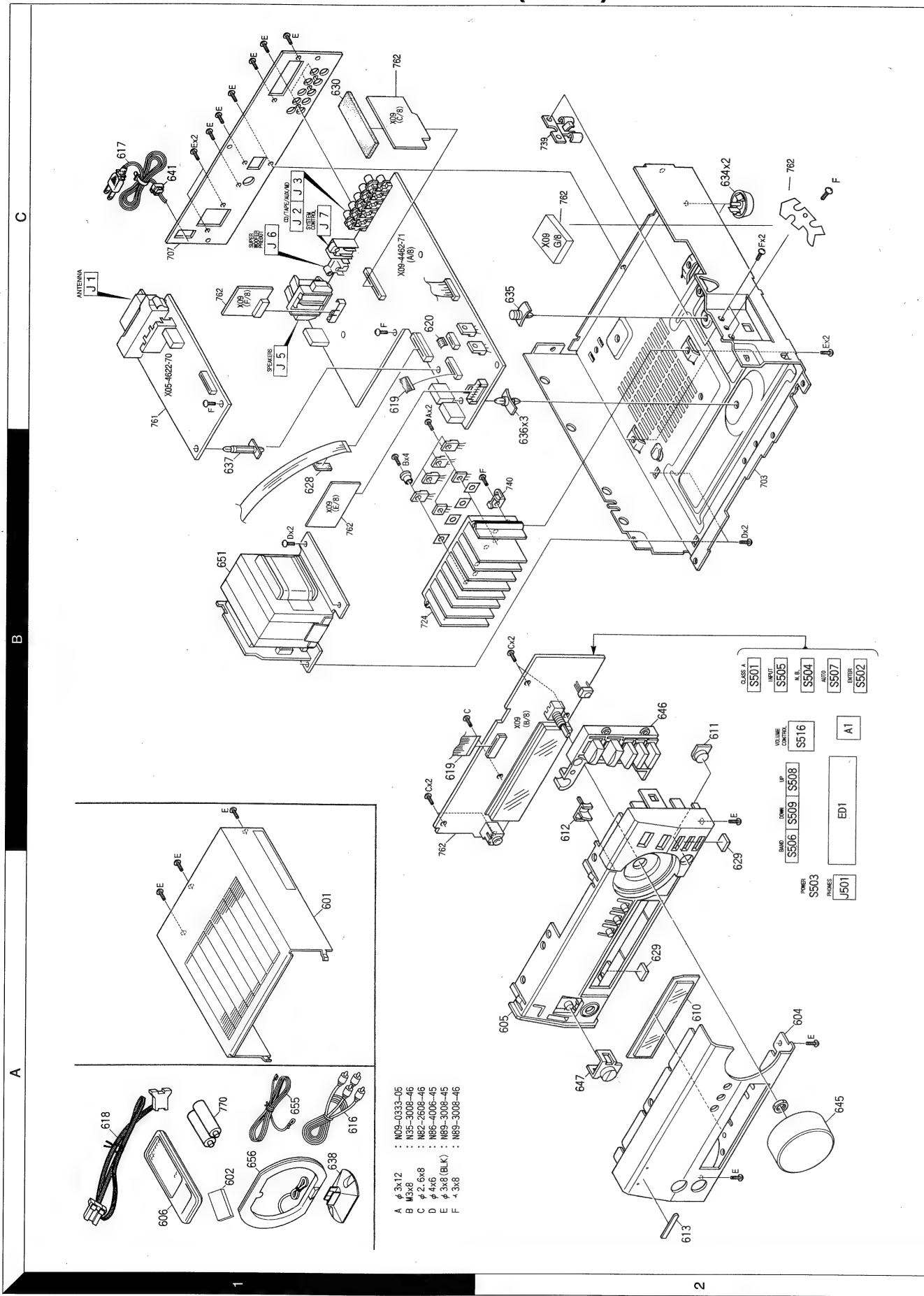


CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Δ indicates safety critical components. For continued protection against risk of fire, replace only with same type and rating fuse(s). To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

The DC voltage is an actual reading measured with a high impedance type voltmeter with no signal input. The measurement value may vary depending on the measuring instruments used or on the product.

EXPLODED (UNIT)

PARTS LIST



* New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

Ref. No	Add- ress	New Parts	Parts No.	Description	Desti- nation	Re- marks
R-SA7						
601	1A		A01-3320-01	METALLIC CABINET		
602	1A		A09-0356-08	BACK COVER		
604	2A		A60-0987-03	PANEL		
605	2A	*	A60-0304-11	REMOTE CONTROLLER ASSY RC-SA70		
606	1A	*	A70-1086-05	FRONT GLASS		
610	2A		B10-2234-03	INDICATOR		
611	2B		B12-0287-04	INDICATOR		
612	2B		B12-0288-04	KENWOOD BADGE		
613	2A		B43-0303-04	WARRANTY CARD		
			B46-0310-03	INSTRUCTION MANUAL(ENGLISH)		
		*	B60-2825-00	INSTRUCTION MANUAL(FRENCH)		
		*	B60-2826-00	INSTRUCTION MANUAL(GERMAN)		
		*	B60-2827-00	INSTRUCTION MANUAL(DUTCH)		
		*	B60-2828-00	INSTRUCTION MANUAL(ITALIAN)		
		*	B60-2829-00	INSTRUCTION MANUAL(SPANISH)		
		*	B60-2849-00	AUDIO CORD		
616	1A		E30-0615-05	AC POWER CORD		
617	1C		E30-2592-15	AC POWER CORD		
618	1A		E30-2721-05	CORD WITH CONNECTOR		
619	1C		E30-2828-05	WIRING HARNESS		
			E35-0400-05	FLAT CABLE		
620	1C		E35-1576-05	SOFT TAPE		
628	1B		G11-0174-04	CUSHION		
629	2B		G11-2200-04	POLYSTYRENE FOAMED FIXTURE		
630	1C		G11-2249-04	PACKING FIXTURE		
		*	H10-7183-02	PROTECTION BAG		
		*	H10-7184-12	PROTECTION BAG		
		*	H12-2298-14	PROTECTION BAG		
		*	H25-0336-04	PROTECTION BAG		
		*	H25-1579-04	PROTECTION BAG		
		*	H25-1581-04	ITEM CARTON CASE		
		*	H50-2088-14	ITEM CARTON CASE		
		*	H50-2089-14	FOOT		
634	2C		J02-0370-05	UNIT HOLDER		
635	2C		J19-3300-05	UNIT HOLDER		
636	2C		J19-3323-05	UNIT HOLDER		
637	1B		J19-3331-05	ANTENNA HOLDER		
638	1A		J19-3645-05	POWER CORD BUSHING		
641	1C		J42-0083-05	WIRE BAND		
			J61-0307-05	KNOB		
645	1A		K29-6358-04	VOLUME FUNCTION		
646	2B		K29-6394-03	POWER TRANSFORMER		
647	2A		K29-6398-04	LEAD WIRE ANTENNA		
651	1B	*	L07-2168-05	LOOP ANTENNA		
655	1A		T90-0809-05	TRANSISTOR		
656	1A		T90-0820-05	TRANSISTOR		
Q21/22			2SD2589	TRANSISTOR		
Q23/24			ZSB1659	TRANSISTOR		
Q27/28			ZSC4137F50(V,W)	TRANSISTOR		

L: Scandinavia K: USA P: Canada R: Mexico
Y: PX(Far East, Hawaii) T: Europe E: Germany G: Mexico
V: AAFES(Europe) X: Australia M: Other Areas

Δ indicates safety critical components.

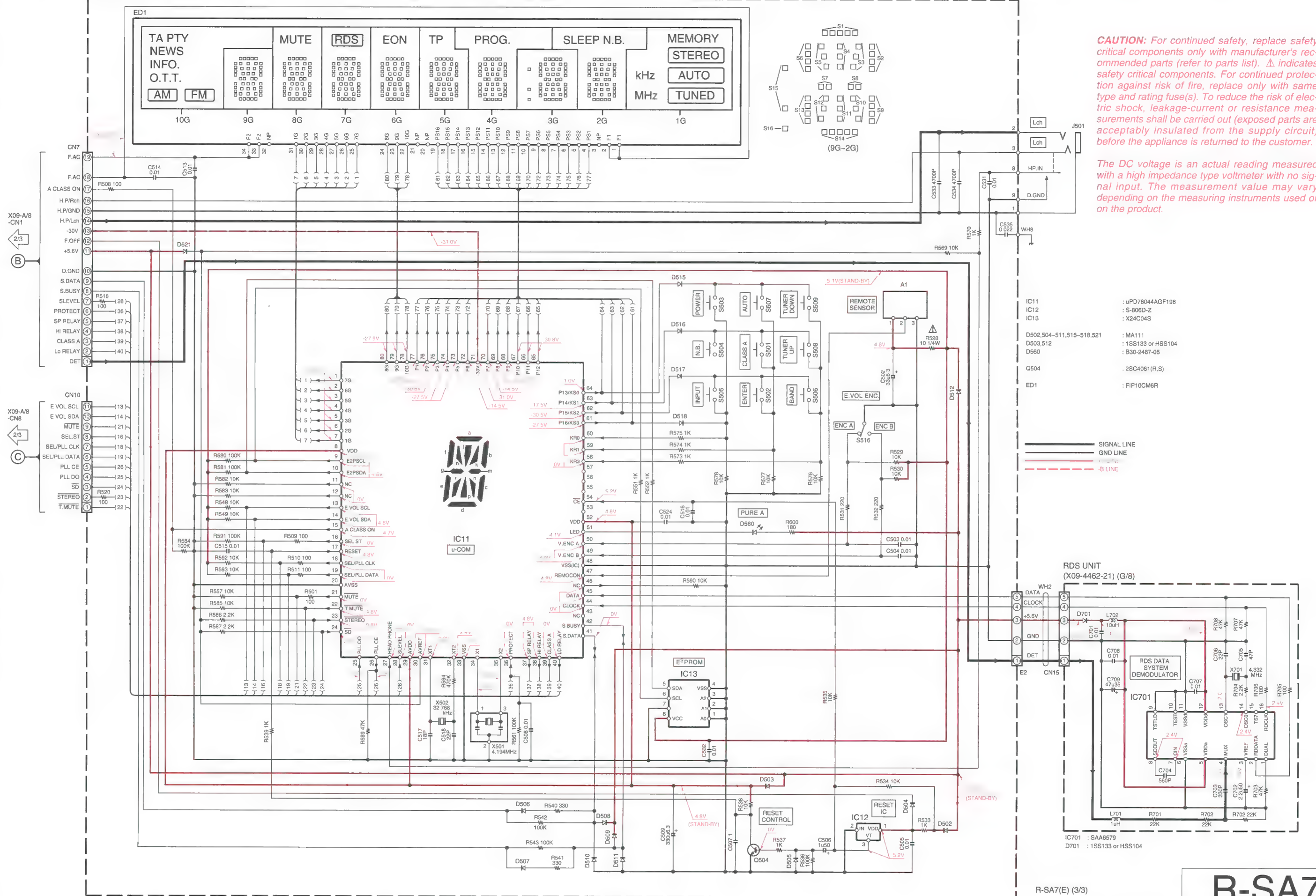
* New Parts
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Ref. No	Add- ress	New Parts	Parts No.	Description	Desti- nation	Re- marks
TUNER UNIT (X05-4622-70)						
C1			CE04LW1C470M	ELECTRO		
C2			CE04LW1H010M	ELECTRO		
C3	-8		CK73FB1H103K	CHIP C		
C9			C91-0769-05	CERAMIC		
C30			CK73EB1E473K	CHIP C		
C31			CE04LW1C470M	ELECTRO		
C32			CK73FB1H103K	CHIP C		
C33			CE04LW1C100M	ELECTRO		
C34			CK73EB1E104K	CHIP C		
C35			CE04LW1C100M	ELECTRO		
C36			CK73FB1E473K	CHIP C		
C37			CK73EF1E105Z	CHIP C		
C38			C90-3217-05	ELECTRO		
C40			C90-3253-05	ELECTRO		
C41			C90-3251-05	ELECTRO		
C42			C90-3240-05	ELECTRO		
C43			CE04LW1H47M	ELECTRO		
C44			CK73FB1E473K	CHIP C		
C45			CK73FB1H102J	CHIP C		
C46			CE04LW1A101M	ELECTRO		
C47			CK73FB1H682K	CHIP C		
C48			CK73FSL1H101J	CHIP C		
C49			C90-3253-05	ELECTRO		
C50			CK73FB1H102K	CHIP C		
C51/52			C90-3217-05	ELECTRO		
C53/54			CK73FB1H223K	CHIP C		
C55/56			C90-3240-05	ELECTRO		
C57/58			CK73FB1H682K	CHIP C		
C60			CK73FB1E104K	CHIP C		
C61			CK73FB1E473K	CHIP C		
C63			CK73FCH1H040C	CHIP C		
C64			CK73FB1H333K	CHIP C		
C66			CK73FCH1H060D	CHIP C		
C67			CK73FCH1H220J	CHIP C		
C68			CK73FSL1H020C	CHIP C		
C69			CK73FB1H103K	CHIP C		
C70			CK73FSL1H101J	CHIP C		
C81			CK73FCH1H220J	CHIP C		
C82			CK73FCH1H220J	CHIP C		
C84			CK73FB1H102K	CHIP C		
C85			C91-0745-05	CERAMIC		
C86			C91-0757-05	CERAMIC		
C87			CE04LW1A470M	ELECTRO		
C89			CE04LW1C470M	ELECTRO		
C90			CE04LW1H2R2M	ELECTRO		
C91			CQ92FM1H223J	MYLAR		
C92			CK73FSL1H471J	CHIP C		
C93			CK73FB1H103K	CHIP C		
C94			CK73FB1H102K	CHIP C		
C95			CK73FCH1H470J	CHIP C		
C96			CK73FSL1H101J	CHIP C		
CN1			E40-4609-05	PIN ASSY		

L: Scandinavia K: USA P: Canada R: Mexico
Y: PX(Far East, Hawaii) T: Europe E: Germany G: Mexico
V: AAFES(Europe) X: Australia M: Other Areas

Δ indicates safety critical components.

DISPLAY and u-COM UNIT (X09-4462-71) (B/B)



R-SA7(E) (3/3)

Y05-3240-00

R-SA7

KENWOOD

* New Parts

Parts without **Parts No.** are not supplied.
Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

3

Ref. No	Add- ress	New Parts	Parts No.	Description	Desti- nation	Re- marks
CN2			E40-4871-05	PIN ASSY		
J1			E20-0321-05	LOCK TERMINAL BOARD(2P,F)		
J1			E70-0052-05	LOCK TERMINAL BOARD		
J2			F10-1053-04	SHIELDING PLATE		
CF1 ,2			L72-0536-05	CERAMIC FILTER		
L31		*	L30-0929-05	FM IFT		
L32		*	L30-0930-05	FM IFT		
L33			L30-0911-05	AM IFT		
L34			L79-1237-05	LC FILTER		
L35 ,36			L79-1236-05	LC FILTER		
L61			L40-1091-17	SMALL FIXED INDUCTOR(1UH)		
L62			L39-1348-05	COMBINATION COIL		
L63			L40-1001-17	SMALL FIXED INDUCTOR(10UH,K)		
L81			L40-1091-17	SMALL FIXED INDUCTOR(1UH)		
X31			L78-0637-05	RESONATOR (456KHZ)		
X81			L77-1122-05	CRYSTAL RESONATOR(7.2MHZ)		
R1			RD14NB2E101J	RD 100 J 1/4W		
R2			RK73EB2B221J	CHIP R 220 J 1/8W		
R4			RK73FB2A681J	CHIP R 680 J 1/10W		
R5			RK73FB2A331J	CHIP R 330 J 1/10W		
R6			RK73FB2A220J	CHIP R 22 J 1/10W		
R7			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R8			RK73FB2A331J	CHIP R 330 J 1/10W		
R10			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R11			RK73FB2A681J	CHIP R 680 J 1/10W		
R12			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R13 ,14			RK73FB2A331J	CHIP R 330 J 1/10W		
R15			RK73FB2A101J	CHIP R 100 J 1/10W		
R16			RK73FB2A220J	CHIP R 22 J 1/10W		
R17			RK73FB2A621J	CHIP R 620 J 1/10W		
R18			RK73FB2A123J	CHIP R 12K J 1/10W		
R19			RK73FB2A470J	CHIP R 47 J 1/10W		
R20			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R31			RS14KB3A820J	FL-PROOF RS 82 J 1W		
R32			RK73EB2B562J	CHIP R 5.6K J 1/8W		
R33			RK73FB2A302J	CHIP R 3.0K J 1/10W		
R34			RK73FB2A822J	CHIP R 8.2K J 1/10W		
R35			RK73FB2A333J	CHIP R 33K J 1/10W		
R36			RK73FB2A393J	CHIP R 39K J 1/10W		
R37			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R38			RK73FB2A333J	CHIP R 33K J 1/10W		
R39			RK73FB2A223J	CHIP R 22K J 1/10W		
R40			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R41			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R42			RK73FB2A473J	CHIP R 47K J 1/10W		
R43 ,44			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R45 ,46			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R47 ,48			RK73FB2A392J	CHIP R 3.9K J 1/10W		
R49			RK73FB2A473J	CHIP R 47K J 1/10W		
R51			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R52			RK73FB2A104J	CHIP R 100K J 1/10W		
R53			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R54			RK73FB2A683J	CHIP R 68K J 1/10W		

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Ref. No	Add- ress	New Parts	Parts No.	Description	Desti- nation	Re- marks
R55			RK73FB2A473J	CHIP R 47K J 1/10W		
R56			RK73FB2A104J	CHIP R 100K J 1/10W		
R59			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R67			RK73FB2A104J	CHIP R 100K J 1/10W		
R80			RK73EB2B102J	CHIP R 1.0K J 1/8W		
R81 -83			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R84			RK73FB2A103J	CHIP R 10K J 1/10W		
R85 -88			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R89			RD14NB2E101J	RD 100 J 1/4W		
R90			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R91			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R92			RK73FB2A123J	CHIP R 12K J 1/10W		
R93			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R94			RD14NB2E561J	RD 560 J 1/4W		
R101,102			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R103			RK73FB2A821J	CHIP R 820 J 1/10W		
R104			RK73FB2A473J	CHIP R 47K J 1/10W		
R105			RK73FB2A103J	CHIP R 10K J 1/10W		
W51 -54			R92-0670-05	CHIP R 0 OHM		
W56 -58			R92-0679-05	CHIP R 0 OHM		
W59 -61			R92-0670-05	CHIP R 0 OHM		
W62 -67			R92-0679-05	CHIP R 0 OHM		
W69 -71			R92-0679-05	CHIP R 0 OHM		
W80			R92-0670-05	CHIP R 0 OHM		
W81			R92-0679-05	CHIP R 0 OHM		
W83 ,84			R92-0679-05	CHIP R 0 OHM		
D1			HSS104	DIODE		
D1			1SS133	DIODE		
D31			MTZJ8.2(B)	ZENER DIODE		
D31			UZ-8.2BSB	ZENER DIODE		
D32			MA111	DIODE		
D33			HSS104	DIODE		
D33			1SS133	DIODE		
D61 ,62			HSS104	DIODE		
D61 ,62			1SS133	DIODE		
D81			MTZJ5.1(B)	ZENER DIODE		
D81			UZ-5.1BSB	ZENER DIODE		
D101			MTZJ3.3(B)	ZENER DIODE		
D101			UZ-3.3BSB	ZENER DIODE		
IC1			LA1836	ANALOGUE IC		
IC2			LC72131	MOS-IC		
IC3			M5223FP	IC(OP AMP X4)		
Q1 ,2			2SC2714(R,O)	TRANSISTOR		
Q3			2SA1576(R,S)	TRANSISTOR		
Q3			2SB1218A(Q,R)	TRANSISTOR		
Q31 ,32			2SC4081(R,S)	TRANSISTOR		
Q31 ,32			2SD1819A(Q,R)	TRANSISTOR		
Q81			2SA1576(R,S)	TRANSISTOR		
Q81			2SB1218A(Q,R)	TRANSISTOR		
Q101,102			2SD2114K	TRANSISTOR		
Q103			2SA1576(R,S)	TRANSISTOR		
Q103			2SB1218A(Q,R)	TRANSISTOR		
A1			W02-2565-05	FM FRONT-END ASSY		

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PARTS LIST

R-SA7

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Ref. No	Add- ress	New Parts	Parts No.	Description	Desti- nation	Re- marks
AUDIO UNIT (X09-4462-71)						
D560			B30-2467-05	LED		
C1 -10			CC73FSL1H221J	CHIP C	220PF	J
C21 ,22			CK73FB1H103K	CHIP C	0.010UF	K
C23			CC73FSL1H471J	CHIP C	470PF	J
C31 ,32			CE04KW1H010M	ELECTRO	1.0UF	50WV
C33 ,34			CC73FSL1H221J	CHIP C	220PF	J
C35 ,36			CC73FSL1H101J	CHIP C	100PF	J
C37 ,38			CE04KW1C100M	ELECTRO	10UF	16WV
C39 ,40			CK73FB1H103K	CHIP C	0.010UF	K
C41 ,42			CE04KW1H2R2M	ELECTRO	2.2UF	50WV
C43			CE04KW1C470M	ELECTRO	47UF	16WV
C44			C90-3650-05	ELECTRO	100UF	16WV
C45			CC73FSL1H102J	CHIP C	1000PF	J
C46 ,47			CC73FSL1H221J	CHIP C	220PF	J
C50 -53			CK73FB1E104K	CHIP C	0.10UF	K
C54 ,55			CK73FB1H562K	CHIP C	5600PF	K
C56			CE04KW1H2R2M	ELECTRO	2.2UF	50WV
C57 ,58			CE04KW1C100M	ELECTRO	10UF	16WV
C59 ,60			CC73FSL1H101J	CHIP C	100PF	J
C61 ,62			CC73FSL1H221J	CHIP C	220PF	J
C70		*	C90-3683-05	ELECTRO	4.7UF	50WV
C71 ,72			C90-3622-05	ELECTRO	3300UF	35WV
C74 ,75			CK73FB1H103K	CHIP C	0.010UF	K
C76			CK73FB1H223K	CHIP C	0.022UF	K
C77			CE04KW1E222M	ELECTRO	2200UF	25WV
C78			CE04DW1V221M	ELECTRO	220UF	35WV
C79			CK73FB1E104K	CHIP C	0.10UF	K
C80 ,81			C90-3649-05	ELECTRO	47UF	16WV
C82			CC73FSL1H102J	CHIP C	1000PF	J
C83			C90-3658-05	ELECTRO	10UF	16WV
C85			C90-3649-05	ELECTRO	47UF	16WV
C87			CK73FB1E104K	CHIP C	0.10UF	K
C101			C90-3715-05	ELECTRO	4.7UF	35WV
C102			C90-3644-05	ELECTRO	220UF	10WV
C103			C90-3680-05	ELECTRO	1UF	50WV
C104			C90-3715-05	ELECTRO	4.7UF	35WV
C105			CC73FSL1H471J	CHIP C	470PF	J
C111-114			CC45FSL1H101J	CERAMIC	100PF	J
C117,118			CK73FB1H103K	CHIP C	0.010UF	K
C119,120			CC73FSL1H102J	CHIP C	1000PF	J
C121,122			CK73FB1E104K	CHIP C	0.10UF	K
C131,132			CK45FF1H472Z	CERAMIC	4700PF	Z
C133			CC45FSL1H102J	CERAMIC	1000PF	J
C141			CK73FB1H103K	CHIP C	0.010UF	K
C161			C90-3651-05	ELECTRO	220UF	16WV
C162			C90-3649-05	ELECTRO	47UF	16WV
C163			CK73FB1H223K	CHIP C	0.022UF	K
C201,202			CE04KW1C220M	ELECTRO	22UF	16WV
C203,204			CC73FSL1H221J	CHIP C	220PF	J
C205,206			CC73FSL1H101J	CHIP C	100PF	J
C207,208			CE04KW1A101M	ELECTRO	100UF	10WV
C209,210			CC45FSL1H090D	CERAMIC	9.0PF	D

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C211-214			CC73FSL1H101J	CHIP C	100PF	J
C261,262			C90-3671-05	ELECTRO	47UF	35WV
C271,272			CC73FSL1H101J	CHIP C	100PF	J
C273-276			CC73FSL1H471J	CHIP C	470PF	J
C277,278		*	CC73ECH1H271J	CHIP C	270PF	J
C279			CQ93FMG1H102J	MYLAR	1000PF	J
C301			C90-3672-05	ELECTRO	100UF	35WV
C302			C90-3687-05	ELECTRO	47UF	50WV
C303			C90-3716-05	ELECTRO	22UF	35WV
C305			C90-3662-05	ELECTRO	100UF	25WV
C306			C90-3658-05	ELECTRO	10UF	16WV
C307			C90-3649-05	ELECTRO	47UF	16WV
C308			C90-3715-05	ELECTRO	4.7UF	35WV
C321,322			CK73FB1H103K	CHIP C	0.010UF	K
C502			C90-3211-05	ELECTRO	33UF	6.3WV
C503-505			CK73FB1H103K	CHIP C	0.010UF	K
C506			C90-3253-05	ELECTRO	1.0UF	50WV
C507			CK73EF1C105Z	CHIP C	1.0UF	Z
C508			CK73FB1H103K	CHIP C	0.010UF	K
C509			C90-3216-05	ELECTRO	330UF	6.3WV
C513-515			CK73FB1H103K	CHIP C	0.010UF	K
C516			C91-0769-05	CERAMIC	0.010UF	K
C517			CC73FCH1H180J	CHIP C	18PF	J
C518			CC73FCH1H220J	CHIP C	22PF	J
C524			CK73EB1H103K	CHIP C	0.010UF	K
C528,529			CC73FSL1H221J	CHIP C	220PF	J
C531,532			CK73FB1H103K	CHIP C	0.010UF	K
C533,534			CK73FB1H472K	CHIP C	4700PF	K
C535			CK73FB1H223K	CHIP C	0.022UF	K
C701			CK45FF1H103Z	CERAMIC	0.010UF	Z
C702		*	C90-3681-05	ELECTRO	2.2UF	50WV
C703			CC45FSL1H331J	CERAMIC	330PF	J
C704			CK45FB1H561K	CERAMIC	560PF	K
C705			CC73FCH1H470J	CHIP C	47PF	J
C706			CC73FCH1H220J	CHIP C	22PF	J
C707,708			CK73FB1H103K	CHIP C	0.010UF	K
C709			C90-3671-05	ELECTRO	47UF	35WV
CN1			E40-4906-05	FLAT CABLE CONNECTOR		
CN2			E40-9848-05	PIN ASSY		
CN3			E40-9831-05	SOCKET FOR PIN ASSY		
CN4			E40-4234-05	FLAT CABLE CONNECTOR		
CN5			E40-4809-05	PIN ASSY		
CN6			E40-4810-05	SOCKET FOR PIN ASSY		
CN7			E40-4944-05	FLAT CABLE CONNECTOR		
CN8			E40-4898-05	FLAT CABLE CONNECTOR		
CN9			E40-4245-05	PIN ASSY		
CN10			E40-4936-05	FLAT CABLE CONNECTOR		
CN13			E40-4809-05	PIN ASSY		
CN14			E40-4810-05	SOCKET FOR PIN ASSY		
CN15			E40-4295-05	FLAT CABLE CONNECTOR		
CN21,22			E40-4871-05	PIN ASSY		
J2			E63-0046-15	PHONO JACK		
J3			E63-0047-15	PHONO JACK		
J5			E70-0053-05	LOCK TERMINAL BOARD		

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J6			E63-0116-05	PHONO JACK		
J7			E08-0312-05	RECTANGULAR RECEPTACLE		
J501			E11-0300-05	PHONE JACK		
Δ F1			F05-4016-05	FUSE (SEMKO) (250V T400MA)		
J10			F10-0954-04	SHIELDING PLATE		
CN11,12		*	J19-5717-03	HOLDER		
			J13-0075-05	FUSE CLIP		
L701			L40-1091-17	SMALL FIXED INDUCTOR(1UH)		
L702			L40-1001-17	SMALL FIXED INDUCTOR(10UH,K)		
X501			L78-0267-05	RESONATOR (4.194MHZ)		
X502			L77-2173-05	CRYSTAL RESONATOR(32.768KHZ)		
X701			L77-2002-05	CRYSTAL RESONATOR(4.332MHZ)		
R1 ,2			RK73FB2A221J	CHIP R 220 J 1/10W		
R3 ,4			RK73FB2A224J	CHIP R 220K J 1/10W		
R5 ,6			RK73FB2A221J	CHIP R 220 J 1/10W		
R7 ,8			RK73FB2A224J	CHIP R 220K J 1/10W		
R9 ,10			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R11 ,12			RK73FB2A224J	CHIP R 220K J 1/10W		
R13 ,14			RK73FB2A221J	CHIP R 220 J 1/10W		
R15 ,16			RK73FB2A224J	CHIP R 220K J 1/10W		
R17 ,18			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R19 ,20			RK73FB2A224J	CHIP R 220K J 1/10W		
R21 ,22			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R23 ,24			RK73FB2A471J	CHIP R 470 J 1/10W		
R28			RS14KB3D151J	FL-PROOF RS 150 J 2W		
R29 -32			RK73FB2A224J	CHIP R 220K J 1/10W		
R35 ,36			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R37 ,38			RK73FB2A822J	CHIP R 8.2K J 1/10W		
R39 ,40			RD14NB2E2R2J	RD 2.2 J 1/4W		
R41 ,42			RK73FB2A562J	CHIP R 5.6K J 1/10W		
Δ R47			RD14NB2E560J	RD 56 J 1/4W		
R50			RS14KB3A151J	FL-PROOF RS 150 J 1W		
R51			RK73FB2A103J	CHIP R 10K J 1/10W		
R53			RK73FB2A333J	CHIP R 33K J 1/10W		
R54			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R55			RK73FB2A333J	CHIP R 33K J 1/10W		
R61			RK73FB2A472J	CHIP R 4.7K J 1/10W		
Δ R62			RK73FB2A473J	CHIP R 47K J 1/10W		
Δ R65			RD14NB2E5R6J	RD 5.6 J 1/4W		
Δ R66			RD14NB2E330J	RD 33 J 1/4W		
R70			RK73FB2A153J	CHIP R 15K J 1/10W		
R71			RS14KB3A222J	FL-PROOF RS 2.2K J 1W		
Δ R72			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R73			RD14BB2C222J	RD 2.2K J 1/4W		
R74			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R75			RK73FB2A473J	CHIP R 47K J 1/10W		
R76			RK73FB2A103J	CHIP R 10K J 1/10W		
R81			RK73FB2A101J	CHIP R 100 J 1/10W		
R101			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R102			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R103			RK73FB2A473J	CHIP R 47K J 1/10W		
R105			RK73FB2A103J	CHIP R 10K J 1/10W		
R106			RK73FB2A622J	CHIP R 6.2K J 1/10W		
R111-114			RS14KB3DR22J	FL-PROOF RS 0.22 J 2W		

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R121			RK73FB2A473J	CHIP R 47K J 1/10W		
R122			RD14NB2E681J	RD 680 J 1/4W		
R123,124			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R125,126			RK73FB2A133J	CHIP R 13K J 1/10W		
R127,128			RK73FB2A912J	CHIP R 9.1K J 1/10W		
R129-132			RD14NB2E220J	RD 22 J 1/4W		
R135,136			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R137			RK73FB2A471J	CHIP R 470 J 1/10W		
R139,140			RS14KB3A4R7J	FL-PROOF RS 4.7 J 1W		
R141			RK73FB2A473J	CHIP R 47K J 1/10W		
R143,144			RS14KB3A391J	FL-PROOF RS 390 J 1W		
R146			RK73FB2A103J	CHIP R 10K J 1/10W		
R150			RK73FB2A473J	CHIP R 47K J 1/10W		
R151			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R162			RS14KB3A272J	FL-PROOF RS 2.7K J 1W		
R164			RK73FB2A473J	CHIP R 47K J 1/10W		
R201,202			RK73FB2A473J	CHIP R 47K J 1/10W		
R203,204			RK73FB2A100J	CHIP R 10 J 1/10W		
R205,206			RK73FB2A123J	CHIP R 12K J 1/10W		
R207-210			RK73FB2A332J	CHIP R 3.3K J 1/10W		
Δ R213-216			RD14NB2E221J	RD 220 J 1/4W		
Δ R221,222			RD14NB2E181J	RD 180 J 1/4W		
Δ R231,232			RK73FB2A222J	CHIP R 2.2K J 1/10W		
Δ R241,242			RK73FB2A1R0J	CHIP R 1 J 1/10W		
Δ R243,244			RK73FB2A511J	CHIP R 510 J 1/10W		
Δ R261,262			RD14NB2E270J	RD 27 J 1/4W		
Δ R263,264			RK73FB2A473J	CHIP R 47K J 1/10W		
Δ R302			RD14NB2E560J	RD 56 J 1/4W		
Δ R305			RD14NB2E4R7J	RD 4.7 J 1/4W		
R501			RK73EB2B101J	CHIP R 100 J 1/8W		
R508			RK73EB2B101J	CHIP R 100 J 1/8W		
R509-511			RK73FB2A101J	CHIP R 100 J 1/10W		
R518			RK73FB2A101J	CHIP R 100 J 1/10W		
R520			RK73FB2A101J	CHIP R 100 J 1/10W		
Δ R528			RD14NB2E100J	RD 10 J 1/4W		
R529,530			RK73FB2A103J	CHIP R 10K J 1/10W		
R533			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R534			RK73FB2A103J	CHIP R 10K J 1/10W		
R536			RK73FB2A104J	CHIP R 100K J 1/10W		
R537			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R538			RK73EB2B103J	CHIP R 10K J 1/8W		
R539			RK73EB2B102J	CHIP R 1.0K J 1/8W		
R540,541			RK73FB2A331J	CHIP R 330 J 1/10W		
R542-545			RK73FB2A104J	CHIP R 100K J 1/10W		
R551,552			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R557			RK73EB2B103J	CHIP R 10K J 1/8W		
R561			RK73FB2A104J	CHIP R 100K J 1/10W		
R564			RK73FB2A474J	CHIP R 470K J 1/10W		
R569			RK73FB2A103J	CHIP R 10K J 1/10W		
R570			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R573-575			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R576,577			RK73EB2B103J	CHIP R 10K J 1/8W		
R578			RK73FB2A103J	CHIP R 10K J 1/10W		
R580,581			RK73FB2A104J	CHIP R 100K J 1/10W		
R582,583			RK73FB2A103J	CHIP R 10K J 1/10W		

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PARTS LIST

R-SA7

* New Parts

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Ref. No	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
R584			RK73FB2A104J	CHIP R 100K J 1/10W		
R585			RK73FB2A103J	CHIP R 10K J 1/10W		
R586,587			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R589			RK73FB2A473J	CHIP R 47K J 1/10W		
R590			RK73FB2A103J	CHIP R 10K J 1/10W		
R591			RK73FB2A104J	CHIP R 100K J 1/10W		
R592,593			RK73FB2A103J	CHIP R 10K J 1/10W		
R600			RK73EB2B181J	CHIP R 180 J 1/8W		
R704			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R707,708			RK73FB2A473J	CHIP R 47K J 1/10W		
VR1 ,2			R12-1616-05	TRIMMING POT.(1K)		
W201-208			R92-0679-05	CHIP R 0 OHM		
W214			R92-0679-05	CHIP R 0 OHM		
W251-271			R92-0679-05	CHIP R 0 OHM		
Δ K1 ,2		*	S76-0060-05	MAGNETIC RELAY		
K3			S76-0059-05	MAGNETIC RELAY		
S501-509			S70-0031-05	TACT SWITCH		
PH1 ,2			T95-0149-05	OPTO ISOLATOR		
S516			T99-0559-05	ROTARY ENCODER		
Δ D1			D3SBA20F03	DIODE		
D1			RBV-402LFA	DIODE		
D3 -6			S5688B	DIODE		
D3 -6			1SR139-100	DIODE		
D7			HSS104	DIODE		
D7			1SS133	DIODE		
D8			MA111	DIODE		
D9 ,10			HSS104	DIODE		
D9 ,10			1SS133	DIODE		
D11 ,12			MA111	DIODE		
D21			MTZJ10(B)	ZENER DIODE		
D21			UZ-10BSB	ZENER DIODE		
D23			MTZJ3.9(B)	ZENER DIODE		
D23			UZ-3.9BSB	ZENER DIODE		
D31			MTZJ13(B)	ZENER DIODE		
D31			UZ-13BSB	ZENER DIODE		
D41			HSS104	DIODE		
D41			1SS133	DIODE		
D42			MTZJ5.1(B)	ZENER DIODE		
D42			UZ-5.1BSB	ZENER DIODE		
D53			HSS104	DIODE		
D53			1SS133	DIODE		
D71			MTZJ13(B)	ZENER DIODE		
D71			UZ-13BSB	ZENER DIODE		
D72			MTZJ3.9(B)	ZENER DIODE		
D72			UZ-3.9BSB	ZENER DIODE		
D201,202			HSS104	DIODE		
D201,202			1SS133	DIODE		
D301,302			S5688B	DIODE		
Δ D301,302			1SR139-100	DIODE		
D303,304			MTZJ16(B)	ZENER DIODE		
D303,304			UZ-16BSB	ZENER DIODE		
D305,306			S5688B	DIODE		
D305,306			1SR139-100	DIODE		
Δ D307,308			HSS104A	DIODE		

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Δ D307,308			1SS131	DIODE		
D309			MTZJ6.2(B)	ZENER DIODE		
D309			UZ-6.2BSB	ZENER DIODE		
Δ D310			S5688B	DIODE		
Δ D310			1SR139-100	DIODE		
D311			MTZJ6.8(B)	ZENER DIODE		
D311			UZ-6.8BSB	ZENER DIODE		
D502			MA111	DIODE		
D503			HSS104	DIODE		
D503			1SS133	DIODE		
D504-511			MA111	DIODE		
D512			HSS104	DIODE		
D512			1SS133	DIODE		
D515-518			MA111	DIODE		
D521			MA111	DIODE		
D701			HSS104	DIODE		
D701			1SS133	DIODE		
ED1		*	FIP10CM6R	INDICATOR TUBE		
IC1			TDA7345D	ANALOGUE IC		
IC2			NJM4565M	IC(OP AMP X2)		
Δ IC5			TA7812S	IC(VOLTAGE REGULATOR/ +12V)		
IC7			NJU7313AM	ANALOGUE IC		
IC11		*	UPD78044AGF198	MI-COM IC		
IC12			S-806D-Z	ANALOGUE IC		
IC13			X24C04S	MEMORY IC		
IC701			SAA6579	ANALOGUE IC		
Δ Q1			2SD2012	TRANSISTOR		
Δ Q1			2SD2061(E,F)	TRANSISTOR		
Q2			2SA1576(R,S)	TRANSISTOR		
Δ Q4			2SA1534A(R,S)	TRANSISTOR		
Q5 ,6			2SC4081(R,S)	TRANSISTOR		
Q7			2SA1175(F,E)	TRANSISTOR		
Q7			2SA933S(Q,R)	TRANSISTOR		
Q11 ,12		*	DTC124EUA	DIGITAL TRANSISTOR		
Q11 ,12			UN5212	DIGITAL TRANSISTOR		
Q13			2SC4081(R,S)	TRANSISTOR		
Q15			2SA992(F,E)	TRANSISTOR		
Q16 -18			2SC4081(R,S)	TRANSISTOR		
Q25			2SC4081(R,S)	TRANSISTOR		
Q29 ,30			2SC1845(F,E)	TRANSISTOR		
Δ Q40 ,41			2SA1576(R,S)	TRANSISTOR		
Q201-204			2SC1845(F,E)	TRANSISTOR		
Q205-208			2SA992(F,E)	TRANSISTOR		
Q209,210			2SC1845(F,E)	TRANSISTOR		
Q211,212			2SC4213(B)	TRANSISTOR		
Δ Q301			2SB764(E,F)	TRANSISTOR		
Δ Q302			2SD863(E,F)	TRANSISTOR		
Q504			2SC4081(R,S)	TRANSISTOR		
A1			W02-2561-05	ELECTRIC CIRCUIT MODULE		

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SPECIFICATIONS

[Amplifier section]

Rated power output

Class AB operation

18 watts per channel minimum RMS, both channels driven, at 6 Ω , 1kHz with no more than 10% total harmonic distortion.

(DIN) 1 kHz at 6 Ω , 0.7% T.H.D.12W+12W

Class A operation

5 watts per channel minimum RMS, both channels driven, at 6 Ω , 1 kHz with no more than 10% total harmonic distortion.

Total harmonic distortion.....0.02%(1kHz, 10W, 6 Ω)

Frequency response.....20Hz~100kHz, +0dB, -3dB

input sensitivity/impedance.....200mV/47K Ω

Output level/impedance

SUPER WOOFER PRE OUT.....2.0V/1k Ω TAPE REC.....200mV/1k Ω

Signal to noise ration92dB (IHF'66)

[FM Tuner section]

Tuning frequency range87.5MHz~108MHz

Usable sensitivity (DIN)

MONO1.2 μ V (75 Ω)/13.2dBf(40kHz DEV., S/N26dB)

Signal to noise ratio

(DIN weighted ar 1 kHz, 65.2 dBf input)

MONO.....65dB

STEREO.....60dB

Selectivity (DIN \pm 300kHz).....64dB

Stereo separation (DIN at 1kHz).....40dB

[AM Tuner section]

Tuning frequency range.....531kHz~1,602kHz

Usable sensitivity (30%mod., S/N 20 dB)15 μ V(500 μ V/m)

Signal to noise ratio(at 30%mod., 1mV input)48 dB

Output level/impedance(30%mod., 1mV input).....0.18V/1k Ω **General**

Power consumption45W

DimensionsW : 200mm

H : 75mm

D : 264mm

Weight (net).....3.3kg



1. KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.
2. Sufficient performance may not be possible at very low temperatures(0°C or less).